EDGE Bin Scale 3 Wires LC

Models:
074–11773

Owner’s manual

890–00669
Version 02

Date: 06-20-19

PN895-00818

If this document is partially printed or when only the printed wiring diagram is provided, an electronic version is available on the USB key provided with your EDGE controller or you can go to the following web sites:

- AP website: **http://www.automatedproduction.com/en/apmanuals.php**
- Cumberland website: **http://www.cumberlandpoultry.com/sales-andservice/manuals.html**

All information, illustrations, photos, and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

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WARNING ***Warranty is void if this product is used in a manner not specified by the manufacturer. Every effort has been made to ensure that this manual is complete, accurate and up to date. The information contained in this manual is subject to change without notice.***

Safety Guidelines

Safety guidelines are general-to-specific safety rules that must be followed at all times. This manual is written to help you understand safe operating procedures and problems that can be encountered by the operator and other personnel when using this equipment. Read and save these instructions.

As owner or operator, you are responsible for understanding the requirements, hazards, and precautions that exist and to inform others as required. Unqualified persons must stay out of the work area at all times.

Alterations must not be made to the equipment. Alterations can produce dangerous situations resulting in SERIOUS INJURY or DEATH.

This equipment must be installed in accordance with the current installation codes and applicable regulations, which must be carefully followed in all cases. Authorities having jurisdiction must be consulted before installations are made.

When necessary, you must consider the installation location relative to electrical, fuel and water utilities.

Personnel operating or working around equipment must read this manual. This manual must be delivered with equipment to its owner. Failure to read this manual and its safety instructions is a misuse of the equipment.

ST-0001–4

Cautionary Symbol Definitions

Cautionary symbols appear in this manual and on product decals. The symbols alert the user of potential safety hazards, prohibited activities and mandatory actions. To help you recognize this information, we use the symbols that are defined below.

Table 1-1 *Description of the different cautionary symbols*

Symbol	Description
DANGER	This symbol indicates an imminently hazardous situation which, if not avoided, **will result in serious injury or death.**
WARNING	This symbol indicates a potentially hazardous situation which, if not avoided, **can result in serious injury or death.**
CAUTION	This symbol indicates a potentially hazardous situation which, if not avoided, **can result in minor or moderate injury.**
NOTICE	This symbol is used to address practices not related to personal injury.

Table 1-1 *Description of the different cautionary symbols (cont'd.)*

Symbol	Description
	This symbol indicates a general hazard.
	This symbol indicates a prohibited activity.
	This symbol indicates a mandatory action.

ST-0005–2

Safety Cautions

Use Personal Protective Equipment

- Use appropriate personal protective equipment:

Eye Protection

Respiratory Protection

Foot Protection

Hearing Protection

Head Protection

Fall Protection

Hand Protection

- Wear clothing appropriate to the job.
- Remove all jewelry.
- Tie long hair up and back.

ST-0004–1

Follow Safety Instructions

- Carefully read all safety messages in this manual and safety signs on your machine. Keep signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from the manufacturer.
- Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.
- If you do not understand any part of this manual or need assistance, contact your dealer.

ST-0002–1

Maintain Equipment and Work Area

- Understand service procedures before doing work. Keep area clean and dry.
- Never service equipment while it is operating. Keep hands, feet, and clothing away from moving parts.
- Keep your equipment in proper working condition. Replace worn or broken parts immediately.

ST-0003–1

Install and Operate Electrical Equipment Properly

- Electrical controls must be installed by a qualified electrician and must meet the standards set by applicable local codes (National Electrical Code for the US, Canadian Electric Code, or EN60204 along with applicable European Directives for Europe).
- Lock-out power source before making adjustments, cleaning, or maintaining equipment.
- Make sure all equipment is properly grounded.

ST-0027–4

Electrical safety precautions and usage

Table 1-2 *Safety Symbol Descriptions*

Symbol	Description
	Warning. Read the following text carefully; it contains important information which, if ignored, may cause the controller to operate improperly.
	High Voltage. Hazard of electrical shock. Read the message and follow the instructions carefully.
	Direct current (DC)

Table 1-2 *Safety Symbol Descriptions (cont'd.)*

Symbol	Description
~	Alternating current (AC)
⏚	Protective Earth Ground Terminal, Primarily used for protective earth terminals. Terminal connected to conductive parts of a device for the purpose of safety and is intended to be connected to an external system for protective grounding
⏚	Functional Ground Terminal Primarily used for functional earth terminals which are generally associated with test and measurement circuits. These terminals are not for safety earthing purposes but provide an earth reference point.
NOTE:	To emphasize points or remind readers of something, or to indicate minor problems in the outcome of what they are doing.
CAUTION	Failure to follow the instructions can result in damaged equipment or loss of data or potential problems.
DANGER	Failure to follow the instructions carefully can result in serious or fatal injury.
IMPORTANT:	The following information is of great significance and must be read carefully.
WARNING	Read the following text carefully; it contains important information which, if ignored, may cause the controller to operate improperly.
Tip	Shortcut or a faster way of getting to an end result.

Safety messages

DANGER

Turn off the main electrical disconnect switch prior to servicing any of the system's Expansion Boxes. Failure to do so might lead to serious injury or death.

Always use extreme caution when measuring voltage or performing procedures that require a module to be powered on.

IMPORTANT: *Ensure all your settings are properly configured. Improper configuration of your settings may generate false alerts or fail to generate an alert.*

Electrostatic discharge prevention when manipulating a printed circuit board (PCB)

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled and can result in complete or intermittent failures.

Always follow ESD on a PCB-prevention procedures when you remove and replace components. Ensure that the chassis is electrically connected to earth ground. Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the grounding clip to an unpainted surface of the chassis frame to safely ground unwanted ESD voltages. To guard against ESD damage and shocks, the wrist strap and cord must operate properly. If no wrist strap is available, ground yourself by touching the metal part of the chassis.

For safety, periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohm (Mohm).

Terms of Use

Read and follow all installation, operation, and maintenance information carefully before using the product. Refer to the user documentation for complete product specifications. If the product is used in a manner not specified, the protection provided by the product warranty will be void.

Using the Product According to Your Function

A responsible body is an individual or group responsible for the use and maintenance of equipment, for ensuring that the equipment is operated within its specifications and operating limits, and for ensuring that operators are adequately trained.

Operators use the product for its intended function.

Maintenance personnel perform routine procedures on the product to keep it operating properly. At this level, all procedures whose do not touch high voltage. The maintenance personnel can work on high voltage only if they have the competences as an electrician.

Service personnel are trained to work on live circuits, perform safe installations, and repair products. Only properly trained service personnel may perform installation and service procedures. (In other words: electricians, Service personnel employed by or active in an organization, business, or service).

General Safety Usage

Follow the guidelines given below for safe usage of the product:

- Installation must only be performed by qualified service personnel
- Carefully read all instructions
- Comply with local and national safety codes
- Repairs must only be performed by qualified service personnel
- When replacing the fuses, use only the same type and same rating as specified
- Make sure the unit is disconnected from AC Power when servicing
- Do not try to operate the system if it is damaged. Disconnect the Power from the units and call your local service representative
- Do not operate while condensation is present
- Use of the system in a manner not specified by these instructions may impair the safety protection provided by the system. Do not operate the system outside its rated supply voltages or environmental range
- Omission to read the installation and user manuals or to comply with the warnings and references contained herein can result in serious bodily injury or damages to the controllers

- Do not insert metal objects into the connectors
- Use the system only as specified, or the protection supplied by the product can be compromised
- Follow all installation and maintenance recommendations and consider all provided information regarding product specifications and limitations
- Do not use the system if it does not operate correctly
- The enclosures must be closed and locked at all times, particularly when operating the system
- Use only specified replacement parts

What to look for when you receive your system

Table 1-3 *Shipment contents*

EDGE Bin Scale	1 X EDGE Bin Scale, 1 X Owner manual

Damage inspection

Your system and its components were carefully inspected both electrically and mechanically before shipment. After unpacking all items, check for any obvious signs of physical damage that may have occurred during transit. Report any damage to the shipping agent immediately. Save the original box for possible future shipment.

System overview

EDGE Bin Scale — The Bin Scale system can have up to 8 load cells that connect to a module. The module can then be connected to an *EDGE Controller*, which gives the ability to analyze the weight of feed in the bulk feed tank and ensures the uninterrupted distribution of feed.

Basic product feature

Product name	RS-485 port	Load cell input	OLED display
EDGE Bin Scale	2	8	1

Guidelines on the ideal location for installation

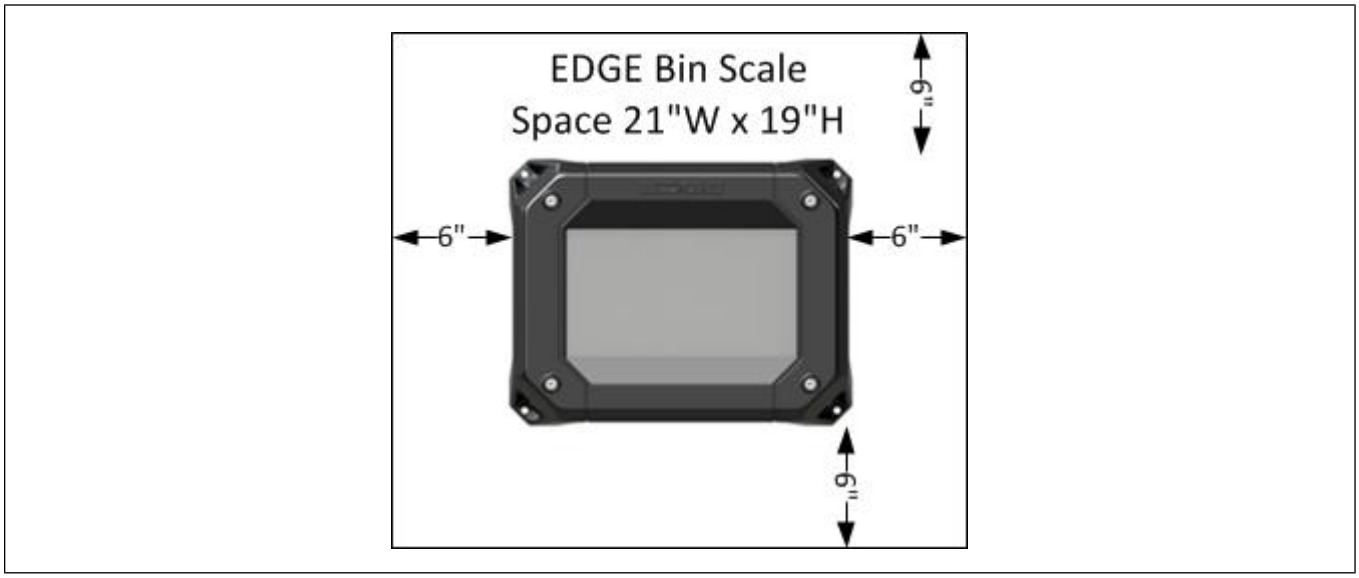
- To avoid exposing the system to harmful gases or excessive dust, install the EDGE Bin Scale far to the silos openings.
- The temperature should not go lower than -40 °F (-40 °C) and should not exceed 104 °F (40 °C).
- Avoid installing in direct sunlight if possible.
- Ensure there is sufficient ventilation around the unit.
- Install the EDGE Bin Scale far from sources of vibrations and where they are not likely to get bumped.

IMPORTANT: *If you are not planning on installing the system immediately, store the units in a cool dry place.*

Clearance around the Bin Scale module

The following minimum clearances must be respected around the Bin Scale module.

Figure 1-1 *Minimum clearance*



Correctly supporting and routing cables

Properly supporting and routing the cables helps avoid electromagnetic interference and wire damage. Rigid conduits up to 1 inch (25.4mm) can be used for connecting to the EDGE .

Cable connectors

WARNING

Use watertight compression cable glands rated IP66 for each cable used.

WARNING

Use silicone to seal the cable gland rated IP66 if more than one cable is use in the same cable gland.

WARNING

The warranty is void if the product enclosures are not sealed correctly and the installation does not respect the manufacturer recommendations.

WARNING

Make sure all cables enter through the bottom of the plastic enclosure. Do not make holes on the top or on the sides of the enclosures. Be careful not to damage the electronic cards located inside the enclosure when drilling holes into the bottom of the enclosure.

NOTICE

The use of flexible tube with water and dust tight connectors at both ends is acceptable.

Cable support

Support the cables with clips or cable trays whenever possible to avoid damage at the connection points.

Cable routing

NOTICE

Never run low voltage (24V and less) wires like communication wires, inputs or sensors wires in the same conduit as a High Voltage (Power) wire.

When low voltage cables run parallel to high voltage cables (120/230/380 VAC), place them at a distance of at least 12 inches (300 mm) from each other to avoid electromagnetic interference.

If low voltage cables cross high voltage cables, ensure they cross at an angle of 90° to minimize electro-magnetic interference.

WARNING

Do not use rigid conduits over 1 inch (25.4mm) for the EDGE Bin Scale.

Determining the Load cell Weight

You must make sure that your bulk feed tank load weight is less than 10,000 lbs. per leg.

To determine load cell weight:

1. Add the empty bulk feed tank weight to the maximum feed weight that the bulk feed tank can hold in lbs. to get the **total weight**.
2. Divide the **total weight** by the number of legs the bulk feed tank has.
    - If this number is 10,000 lbs. or less, use the 10, 000 lbs. load cell.
    - If this weight is greater than 10,000 lbs., you can not use this system.

Empty bulk feed tank weight (lbs.) + Maximum feed weight of bulk feed tank (lbs.)
÷ Number of bulk feed tank legs = load cell weight

Tools needed for installation

Tools needed:

- Drill: 29/64 or 15/32
- Wrenches: 1–1/8”, 5/8”, 9/16”, 3/4”
- Wire cutters
- Impact or ratchet: 1–1/8”, 5/8”, 9/16”, 3/4”
- Wire ties
- Conduit
- Screw driver: electronics flat head

CAUTION

Follow all operating and safety guidelines that were provided with your tools.

Grounding Recommendations for the System

A correctly grounded system protects your equipment from electrical surges and spikes.

CAUTION

Each module must have its own ground connection from a common junction box. Do not run the earth ground cable between the modules.

NOTICE

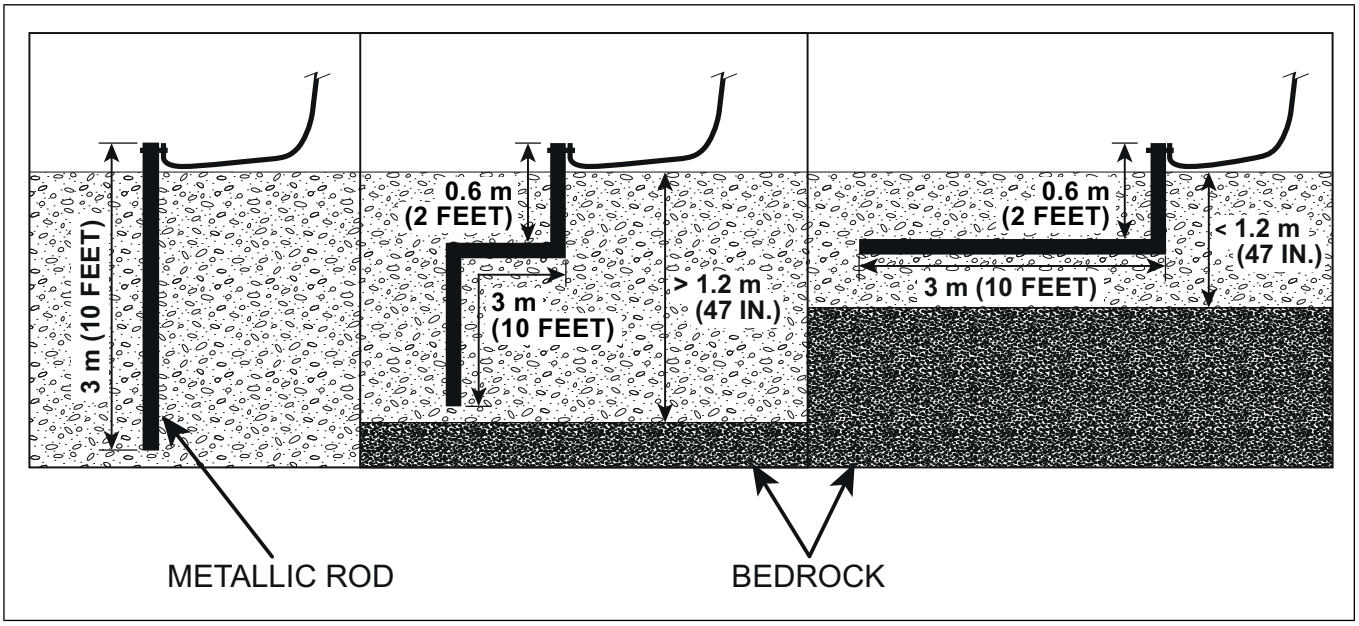
The ground resistance levels must comply with local and national electrical codes.

IMPORTANT: *If outdoor connections are used, mount the enclosure as close as possible to the entry point of the outdoor wiring.*

IMPORTANT: *An improper ground connection voids the system’s warranty.*

Insert the rod into the ground until a few inches of the tip is left above ground level. Attach the cable to the rod tip with an appropriate connector. Attach the other end of the cable to a breaker box or a junction box near the main enclosure.

Figure 1-2 *Grounding installation depending on bedrock depth*



- If the bedrock is more than 3 meters (10 feet) below ground level, drive the grounding rod vertically 3 meters (10 feet) into the ground.
- If the bedrock is more than 1.2 meters (47 inches) below ground level, drive the rod into the ground to bedrock level and bury the remainder horizontally at least 0.6 meters (2 feet) below ground level.
- If the bedrock is less than 1.2 meters (47 inches) deep, bury the rod horizontally at least 0.6 meters (2 feet) below ground level.

NOTE: *Refer to your local regulations and practices if an adequate grounding installation isn't possible.*

Rod Specifications for Grounding

The rod specifications are guidelines only. Refer to your national and local regulations for compliance criteria.

Table 1-4 *Grounding rod specifications*

Item	Description
Material	Metallic, normally steel core.
Rod surface	The surface must be clean. It cannot be coated with paint, varnish or any non-conducting substance.
Minimum diameter	16 mm (5/8 inches)
Minimum length	2440 mm (8 feet)

Cable Specifications for Grounding

The cable specifications are guidelines only. Refer to your national and local regulations for compliance criteria.

Table 1-5 *Grounding Cable Specifications*

Item	Description
Certification and type	CSA, TEW type.
	UL, 1015 type, 12 AWG, 600 V, 105 °C (221 °F), green/yellow insulated wire.
Maximum length	15 meters (50 feet)
Suggested cable	Beldon # 9912, color code 189, or equivalent

NOTES

2 Installation

Topics Covered in this Chapter

- Installing a load cell to a bulk feed tank leg (EDG-122 & 123)
- Lifting the bulk feed tank
- Leveling the bulk feed tank
- Mounting the Bin Scale Module

Installing a load cell to a bulk feed tank leg (EDG-122 & 123)

A load cell must be installed to each bulk feed tank leg for an accurate reading.

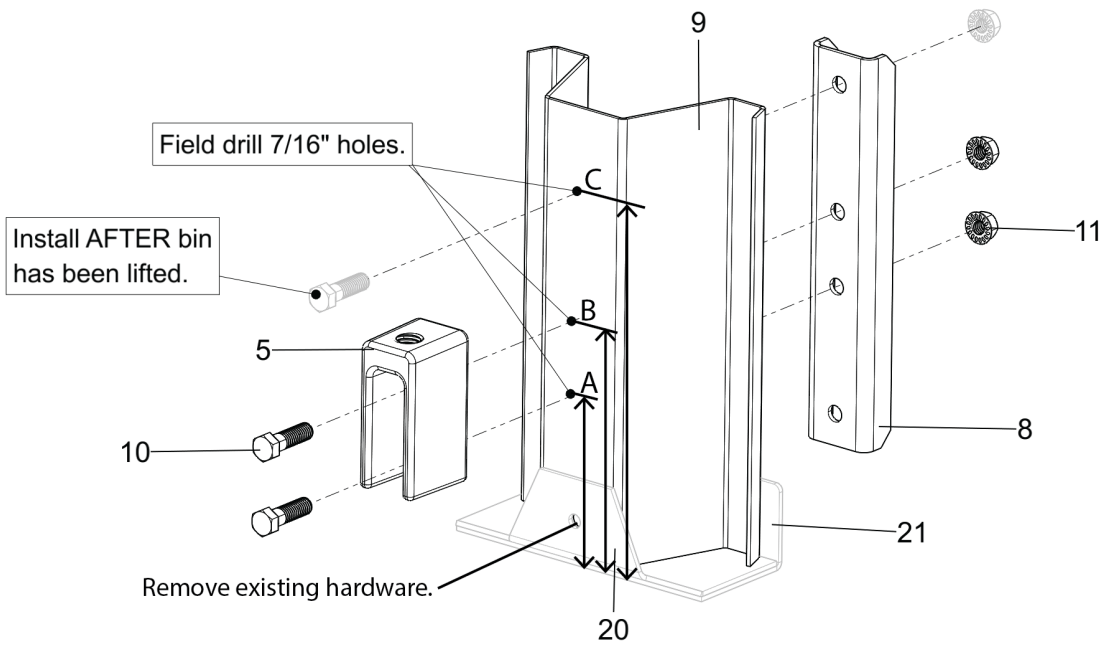
1. If holes do not exist for the load cell leg mount (5), field drill three 7/16 in. holes, (A) at 4.4 in.), (B) at 6.4 in.), and (C) at 9.8 in.) from the bottom of the leg.
2. Remove the hardware from the leg anchor plates (20 and 21) at the bottom of the bulk feed tank leg (9).

   NOTE: *Once the bulk feed tank is lifted and the weight of the bulk feed tank is off of the anchor plates, you can remove them.*
3. Install the load cell leg mount (5) and load cell back brace (8) to the bulk feed tank leg (9) using two 7/16 x 1-1/2 bolts (10) and flange nuts (11).

   IMPORTANT: *Make sure the back brace is fully tightened against the bulk feed tank leg so that the weight of the bulk feed tank is supported by the plate and leg mount and not by the bolt threads.*
4. After the bulk feed tank has been lifted, install the top bolt and nut (10 & 11) through the bulk feed tank leg (9) and the load cell back brace (8).

   NOTE: *Top bolt will interfere with the load cell leg mount (5) until the bulk feed tank has been lifted.*

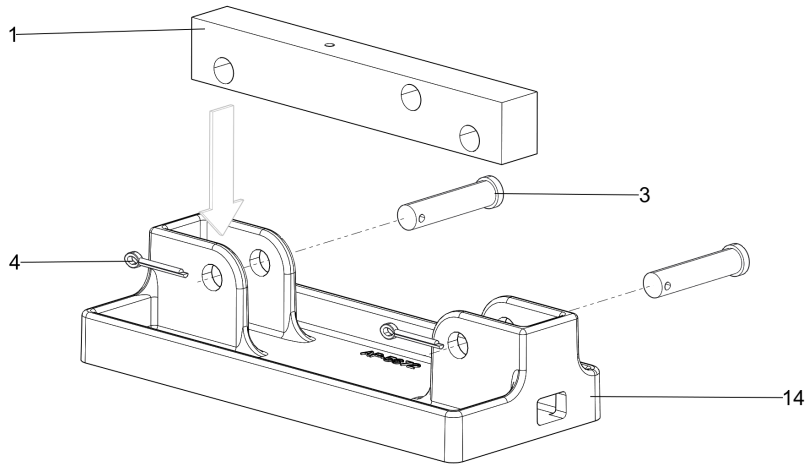
Figure 2-1 *Field drill holes*



A	4.4 inches (11.18 cm)	9	Tank leg
B	6.4 inches (16.26 cm)	10	7/16 x 2 3/4 HHCS bolt (S-9359)
C	9.8 inches (24.90 cm)	11	7/16 flange nut (S-10251)
5	load cell leg mount (AP-5666)	20	Back leg anchor plate (BLK-10057)
8	load cell Back Brace (AP-5669)	21	Front leg anchor plate (BLK-10058)

5. Assemble the load cell transducer (1) to the load cell base (14) using two clevis pins (3) and cotter pins (4).

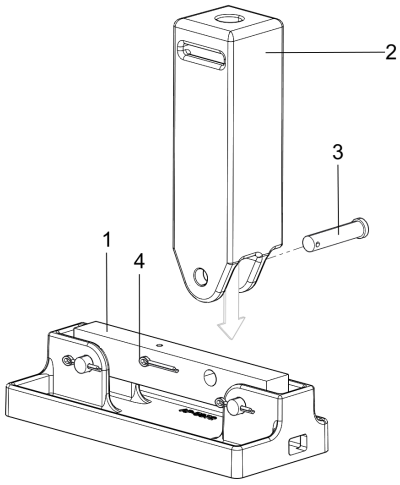
Figure 2-2 *Load cell to base plate*



1	10,000 Feed-Link load cell (INT-4809A)	4	5/32 x 1 cotter pin (S-4196)
3	1/2 x 2 1/4 clevis pin (S-9247)	14	Load cell base plate (AP-5672)

6. Attach the load cell base assembly to load cell support bracket (2) using a clevis pin (3) and cotter pin (4).

Figure 2-3 *Support bracket to load cell*

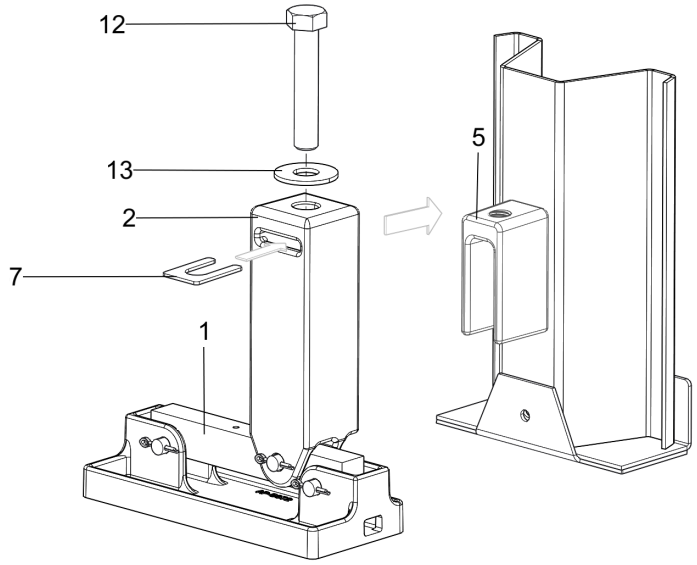


1	10,000 Feed-Link Load cell (INT-4809A)	3	1/2 x 2 1/4 clevis pin (S-9247)
2	Load cell support bracket (AP-5671)	4	5/32 x 1 cotter pin (S-4196)

7. Attach the load cell assembly (2) to the load cell leg mount (5) using a ¾ x 4 bolt (12) and washer (13).

   NOTE: *Only finger tighten the bolt until the load cell support bracket is vertical and the base plate is flat on the concrete pad. A load cell spacer (7) can be used for leveling.*

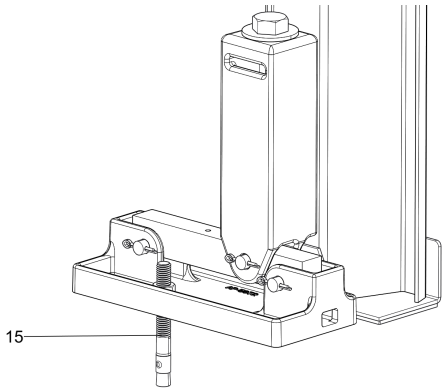
Figure 2-4 *Mounting to bulk feed tank leg*



2	Load cell support bracket (AP-5671)	12	3/4 x 4 HHCS bolt (S-7884)
5	Load cell leg mount (AP-5666)	13	3/4 flat washer (S-866)
7	load cell spacer (AP-5674)		

8. Secure the load cell base plate (14) to the foundation using a minimum of 1/2 in. x 6 in. size anchor bolts (15 – not supplied).

Figure 2-5 *Anchor the base plate*



15 — Anchor bolt (Minimum of 1/2 in. x 6 in. size — not supplied)

Lifting the bulk feed tank

The bulk feed tank must be lifted to place the weight of the bulk feed tank on the load cells.

What You Should Know

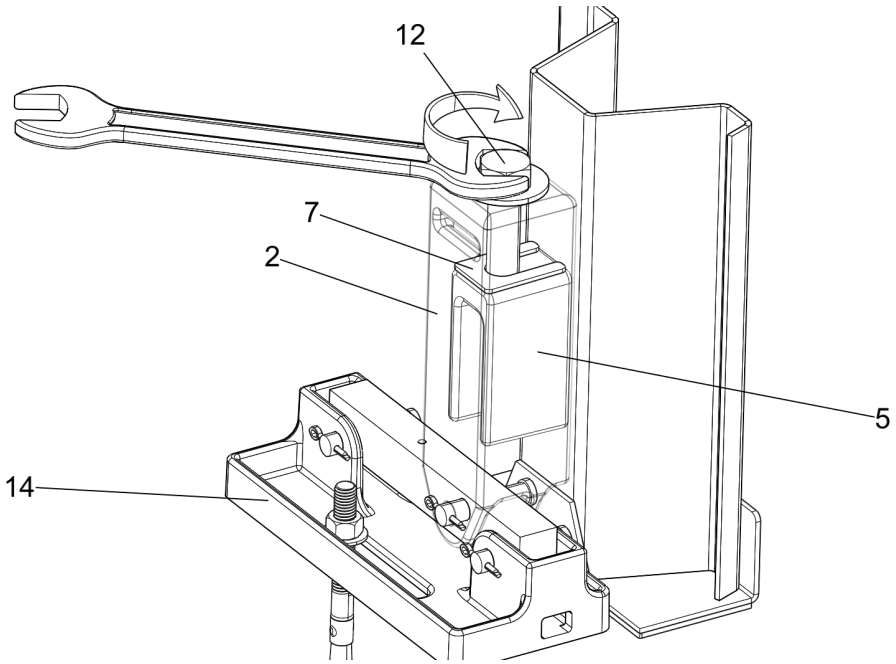
> **CAUTION** ***Only lift the bulk feed tank in small, even increments.***

> **CAUTION** ***Do not raise each leg fully at one time. Lifting the bulk feed tank unevenly can damage the bulk feed tank.***

1. Using a 1–1/8 hand wrench, turn each 3/4 x 4 bolt (12) two full turns working your way around the bulk feed tank, approximately 20 turns for each bolt.
2. Continue working around the bulk feed tank until the load cell leg mount (5) is tight against the top of the load cell support bracket (2) on each leg.

> **CAUTION** ***Do not fully tighten each bolt one at a time.***

Figure 2-6 *Lifting the bulk feed tank*



2	Load cell support bracket (AP-5671)	7	Load cell spacer (AP-5674)
5	Load cell leg mount (AP-5666)	14	Load cell base plate (AP-5672)

Leveling the bulk feed tank

You can level the bulk feed tank on the concrete pad by using the load cell spacers.

Before You Begin

Make sure you have lifted the bulk feed tank evenly and that the bulk feed tank weight has been placed on the load cells.

What You Should Know

IMPORTANT: *Bulk feed tank must be level for an accurate weight measurement.*

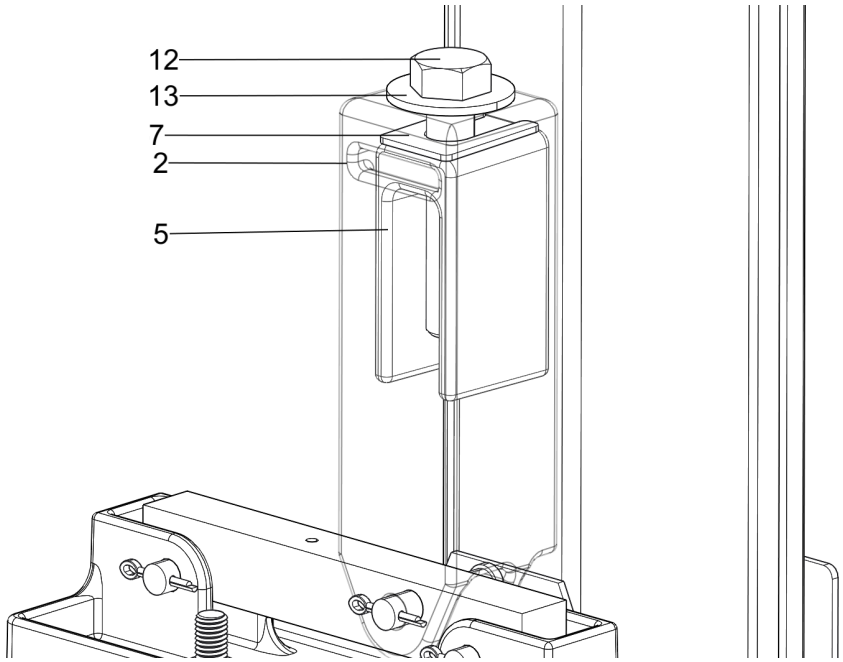
Leveling the bulk feed tank takes a bit of trial and error. It is possible that when you get one leg set, you may have caused another leg to loosen.

1. Test each bulk feed tank leg by trying to move or wiggle the leg.
2. If a bulk feed tank leg moves, then add a load cell spacer (7) between the washer (13) and the load cell leg mount (5) on the bulk feed tank legs that do not move.

   NOTE: *You will need to loosen the bolt (12) to insert the load cell spacer (7) through the slot in the load cell support bracket (2).*
3. After adding the load cell spacer (7), tighten the bolt (12).
4. Test each bulk feed tank leg again by trying to move or wiggle the leg, and if it still moves, add another load cell spacer (7) to the bulk feed tank legs that do not move.

   NOTE: *Be aware that each time you add a load cell spacer, you may loosen another bulk feed tank leg.*
5. Repeat until all bulk feed tank legs support an equal amount of weight.

Figure 2-7 *Leveling bulk feed tank with load cell spacer*



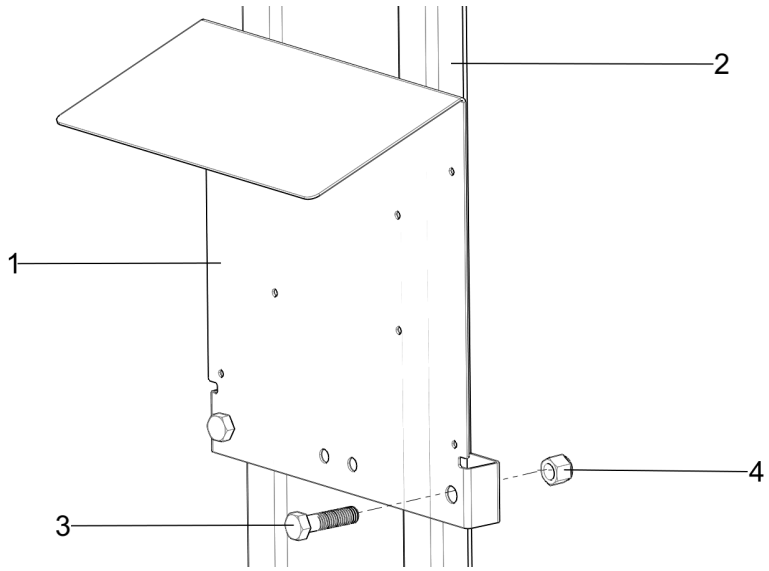
2	Load cell support bracket (AP-5671)	12	3/4 x 4 HHCS bolt (S-7884)
5	Load cell leg mount (AP-5666)	13	3/4 flat washer (S-866)
7	Load cell spacer (AP-5674)		

Mounting the Bin Scale Module

The *Bin Scale Module* can be mounted to the bulk feed tank leg using a mounting plate.

1. Install the *Bin Scale Module* to the Rain Guard Mounting Plate (1).
2. Install the Rain Guard Mounting Plate (1) to the bulk feed tank leg (2) using bolt (3) and nut (4).

Figure 2-8 *Rain Guard Mounting Plate*



1	Rain Guard Mounting Plate (EDG-124)	3	3/8” x 1–1/2” HHCS Bolt (S-10275)
2	Tank leg	4	3/8” Nut (S-7383)

3 Basic connections

Topics Covered in this Chapter

- Preparing the enclosures for installation
- Connecting the Power Supply
- Connecting the EDGE Bin Scale to the communication network
- Connecting a load cell
- Grounding
- Wiring Connections

Preparing the enclosures for installation

The Bin Scale module will need holes drill into the bottom to allow the installation of cable connectors or conduit to the enclosure.

Before You Begin

NOTE: *Up to 1 inch (25.4mm) rigid conduit can be used for the EDGE Bin Scale.*

1. Remove the four screws from the cover of the Bin Scale module.
2. Drill a hole the size of the your cable connector or your rigid conduit through the bottom side of the enclosure.
3. Remove all plastic fragments.
4. Install the cable connector or rigid conduit adaptor to the bottom of the enclosure.

   IMPORTANT: *All cable connectors or conduit must be water tight.*
5. Install the Bin Scale module cover using the four screws.

After You Finish

You will need to mount the Bin Scale module. Refer to Guidelines on the ideal location for installation, Clearance around the Bin Scale module and Mounting the Bin Scale Module sections in this manual.

Connecting the Power Supply

You have to connect a power supply to the *Bin Scale Module*. There are two possible configurations, connecting to the *EDGE Controller* power supply network or to an independent power supply.

What You Should Know

WARNING

Installations must only be performed by qualified service personnel.

The following table will guide you on how to correctly wire the *Bin Scale Module* to respect the power ratings of the different supply.

IMPORTANT: *Do not exceed the power supply rating.*

Power consumption of Bin Scale Modules	
3 Wires LC	3W
4 Wires LC	3W
Available power	
EDGE 6 slot expansion box	5W
EDGE 3 slot expansion box	25W
External power supply (PSU 24V 20W)	20W
For redundant power supply topology, use the available power of the bigger expansion box.	

WARNING

Insulation on conductors must be rated for 600 Volts and 90°C (194°F).

NOTICE

When tightening small terminal blocks, use a torque between 4.43lbf*in (0.5N*m) and 5.2lbf*in (0.6 N*m) to fasten a wire gauge from 16AWG (diameter of 1.29mm or cross sectional area of 1.30mm²) to 18AWG (diameter of 1.02mm or cross sectional area of 0.82mm²).

NOTICE

EDGE network cables have to use class 1 load type. AP/Cumberland recommends using TC-ER cable type.

NOTICE

Refer to the Wiring Methods and Materials section from the National Electric Code to use the correct wire for the installation.

NOTICE

TC-ER conductors in sizes 18 AWG and 16 AWG shall be type FFH-2, KF-2, KFF-2, PAF, PAFF, PF, PFF, PGF, PGFF, PTF, PTFF, RFH-2, RFHH-2, RFHH-3, SF-2, SFF-2, TF, TFF, TFFN, TFN, ZF, or ZFF. Conductor with other types and thicknesses of insulation shall be listed for Class 1 load circuit use.

The recommended installation wire gauge is 16 AWG (diameter of 1.29mm or cross sectional area of 1.30mm²) when using power supply wires at a length of 1000 feet (300 meters).

IMPORTANT: *Consult the wiring diagrams to see the maximum cable distance according to the wire gauge. Consult the appendix Low voltage cable specifications to know the cables requirements.*

To connect to a DC network:

1. Locate the terminals (Automation or Safety on the EDGE Bin Scale you want to connect.
2. Connect the wires (24V and GND) from the EDGE Bin Scale to the network.

   IMPORTANT: *Make sure to connect same signal identification together and use the same network from one side to the other.*

   IMPORTANT: *If redundancy supplies are not used, use the Automation bus.*

   IMPORTANT: *Consult the EDGE Controller user manual to have information about the redundancy supply concept.*

To connect an independent power supply (PSU 24V 20W):

IMPORTANT: ***Install a disconnect switch to interrupt power to L1 and N/L2 electric power lines before connecting the system's main input on the power supply. It must be in close proximity to the equipment and within easy reach of the operator. It must be marked as the disconnecting device for the equipment.***

WARNING

If the disconnect switch or the circuit breaker is used as a sectioning device, the device must be correctly identified with which function of the controller opens the circuit. The Off or Stop and On position must be clearly identified on the sectioning device.

AP/Cumberland recommends using a DPST disconnecting switch in series with a breaker. In the case of the use of a SPST disconnecting switch, connect the SPST disconnecting switch to cut the hot line with a neutral circuit case.

IMPORTANT: ***The SPST disconnecting switch circuit is allowed only in North America under 120Vac. Over 120Vac in North America and whatever the voltage in International markets, only the DPST disconnecting switch is allowed.***

CAUTION

Disconnect power supply before servicing

3. From the Power source, follow the wiring diagram to connect the main voltage supply to the system's main inputs on the PSU 24V 20W.
4. Open the disconnecting switch or breaker before wiring.
5. Plug the wires (L1 to L1, L2/N to L2/N, Earth to Earth) from the PSU 24V 20W into a power source (main voltage supply).
6. Correctly ground the system by using a Functional Earth configuration.
7. From The PSU 24V 20W, connect the "+" in the 24V input and connect the "-" in the GND input on the EDGE Bin Scale.
8. Power on the system and make sure it is receiving Power from the power source.

NOTE: *The working voltage range is between 90 Vac and 264 Vac. The system consumes a power of 20W. Wire in accordance with local and national safety codes. The minimum wires requirements are : use a minimum voltage rating of 300V and a minimum temperature rating of 90°C.*

IMPORTANT: *Make sure to connect same signal identification together and use the same network from one side to the other.*

IMPORTANT: *If redundancy supplies are not used, use the Automation bus*

Connecting the EDGE Bin Scale to the communication network

The communication bus enables communication between the EDGE Main Controller and the EDGE Bin Scale (terminal A and terminal B on the Automation network or the Safety network). There are two communication networks available. One of them serves as a backup network.

What You Should Know

WARNING	***Installation must only be performed by qualified service personnel.***
WARNING	***Insulation on conductors must be rated for 600 Volts and 90°C (194°F).***
NOTICE	***EDGE network cables have to use class 1 load type. AP/Cumberland recommends using TC-ER cable type.***
NOTICE	***Refer to the Wiring Methods and Materials section from the National Electric Code to use the correct wire for the installation.***
NOTICE	***TC-ER conductors in sizes 18 AWG and 16 AWG shall be type FFH-2, KF-2, KFF-2, PAF, PAFF, PF, PFF, PGF, PGFF, PTF, PTFF, RFH-2, RFHH-2, RFHH-3, SF-2, SFF-2, TF, TFF, TFFN, TFN, ZF, or ZFF. Conductor with other types and thicknesses of insulation shall be listed for Class 1 load circuit use.***

1. Locate the terminals Automation or Safety on the EDGE Bin Scale you want to connect.
2. Connect the wires from the EDGE Bin Scale to the network.

IMPORTANT: *Make sure to connect same identifications together and use the same network from one side to the other.*

IMPORTANT: *The communication network must be installed in a daisy chain topology. Consult the wiring diagrams to see the maximum cable distance according to the wire gauge. Consult the appendix Low voltage cable specifications to know the cables requirements.*

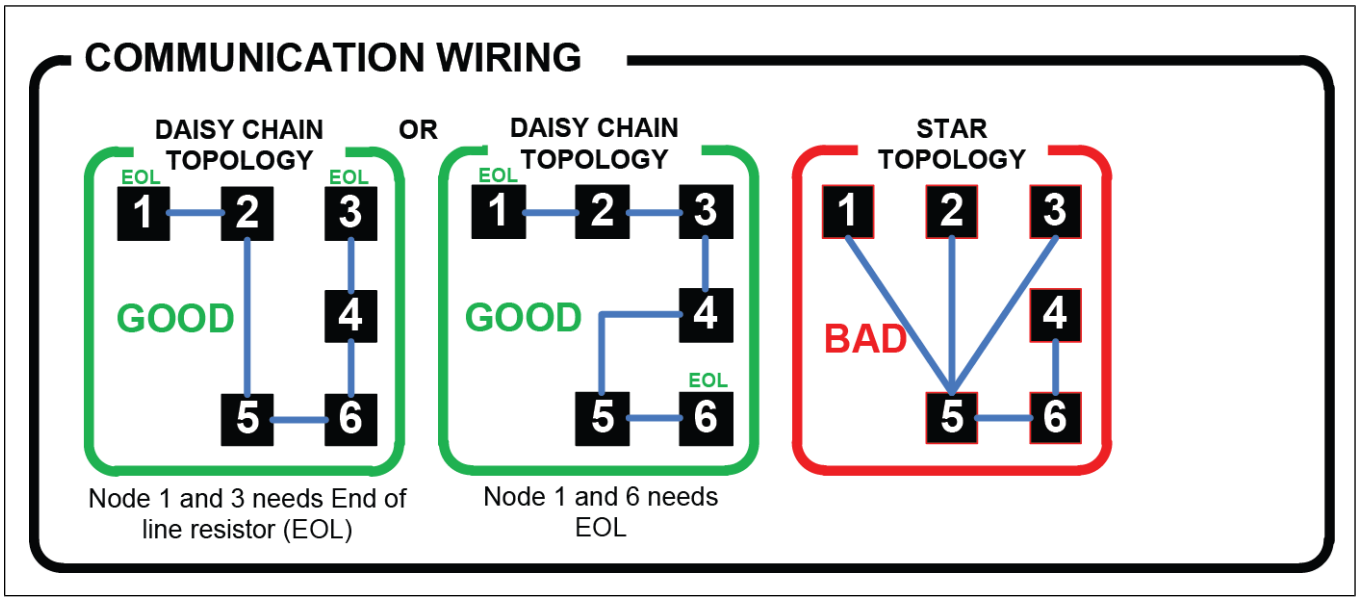
IMPORTANT: *The recommended installation wire gauge is 18 AWG (diameter of 1.02mm or cross sectional area of 0.82mm^2) when using communication wires at a length of 4000 feet (1200 meters). The cable must be twisted pair and shielded.*

NOTICE

When tightening small terminal blocks, use a torque between 4.43lbf*in (0.5N*m) and 5.2lbf*in (0.6 N*m) to fasten a wire gauge from 16AWG (diameter of 1.29mm or cross sectional area of 1.30mm² to 18AWG (diameter of 1.02mm or cross sectional area of 0.82mm²).

The communication network must be installed in a daisy chain topology. The order of the wires is very important. At both ends of network, the End-of-Line must be activated. If the wiring can't be done in a single chain, you might need to deactivate the end-of-line (EOL) resistor to improve communication. AP/Cumberland does not warranty the proper operation if the topology network is not daisy chain.

Figure 3-1 *Daisy Chain Topology*



Connecting a load cell

There is a possibility to connect up to 8 load cells with to EDGE *Bin Scale 3 Wires LC*. A 5V voltage reference of 200mA maximum is available for all outputs SIG+ (LC(x) - SIG+). The outputs LC(x) – SIG+ are the excitation voltage for the load cell. The signal SIG- is the feedback of the load cell.

NOTE: *A minimum wire gage of 24 AWG (diameter of 0.51mm or cross sectional area of 0.20mm²) is required for a proper operating. The maximum cable length allowed (including cable extensions) is 50ft. (15m). The cable must be twisted and shielded.*

IMPORTANT: *Make sure each load cell is connected to the proper signal. False alarms can result if the wires are not properly connected.*

Disconnect supply before servicing.

Lock the enclosure by screwing when wiring is complete or when servicing.

Installation must only be performed by qualified service personnel.

Refer to the wiring diagrams for more information.

Grounding

The EDGE Bin Scale only needs a functional Earth at the EDGE Bin Scale side. The functional Earth connector is located at J5.

The bin and the load cells must use a Protective Earth. The bin and the load cells must be grounded directly on the Earth. The silo metal body should be grounded locally by using rods. The ground rod resistance must not exceed 5 Ohm. Make The bin installation in accordance with local and national safety codes. Certain codes and standards must be followed when lightning protection systems are installed. Standards and sources are listed below:

CAN/CSA-B72–M87: Installation Code for Lightning Protection Systems.

LPI-175: The lightning protection code, published by the Lightning Protection Institute.

NFPA 78: National Fire Protection Association Lightning Protection Code.

ASAE EP381: American Society of Agricultural Engineers, Engineering Practice.

96AUL: Requirements for Master Label for Lightning Protection, developed by Underwriters' Laboratories.

WARNING

If the ground wiring was not done correctly, thunderstorms can destroy the EDGE Bin Scale

NOTICE

When tightening the Earth terminal blocks inside the EDGE Bin Scale, use a torque from 7.9lbf*in (0.9N*m) to 8.9lbf*in (1.0 N*m) to fasten a wire gauge from 14AWG (diameter of 1.62mm or cross sectional area of 2.08mm²) to 16AWG (diameter of 1.29mm or cross sectional area of 1.30mm²).

WARNING

If metal rigid tubes are used, ensure they are correctly grounded.

WARNING

Installation must only be performed by qualified service personnel.

Wiring Connections

The power and communications wires between the *EDGE Controller* and the *Bin Scale 3 Wires LC* must be connected so they can relay information.

WARNING

Disconnect power before servicing.

WARNING

Insulation on conductors must be rated for 600 Volts and 90°C (194°F).

NOTICE

EDGE network cables have to use class 1 load type. AP/Cumberland recommends using TC-ER cable type.

NOTICE

Refer to the Wiring Methods and Materials section from the National Electric Code to use the correct wire for the installation.

NOTICE

TC-ER conductors in sizes 18 AWG and 16 AWG shall be type FFH-2, KF-2, KFF-2, PAF, PAFF, PF, PFF, PGF, PGFF, PTF, PTFF, RFH-2, RFHH-2, RFHH-3, SF-2, SFF-2, TF, TFF, TFFN, TFN, ZF, or ZFF. Conductor with other types and thicknesses of insulation shall be listed for Class 1 load circuit use.

NOTICE

Consult the wiring diagrams to see the maximum cable distance according to the wire gauge. Consult the appendix Low voltage cable specifications to know the cables requirements.

Wiring guidelines

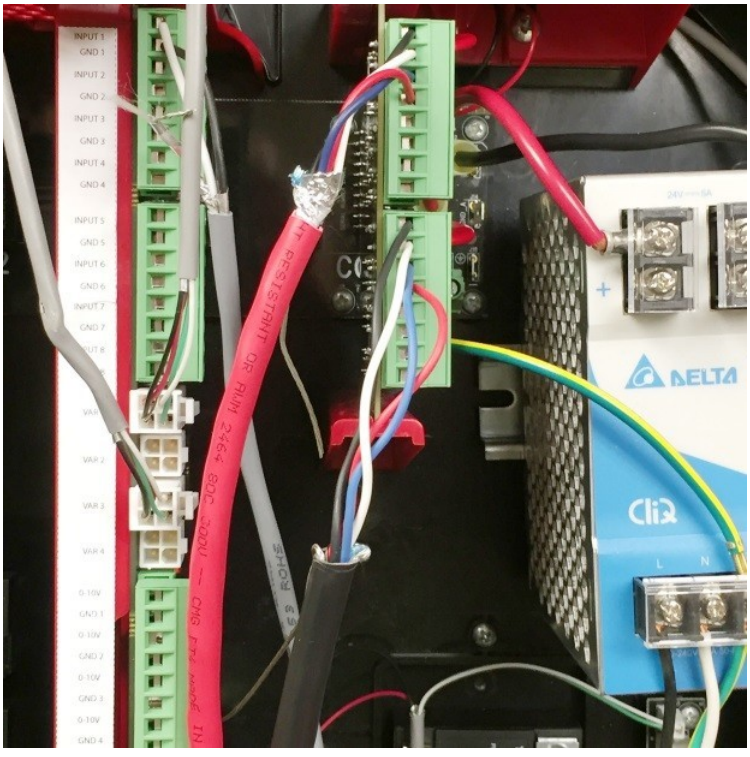
- Bin scale module must be closed of a 3/6–slot; see table below for appropriate wire size.
- The entire communications network must not exceed the length listed for the wire gage to work properly.
- The shield wire for the power and connection wires must be connected to EARTH at one end of the cable.
- It is recommended to use different pathways for the Automation & Safety cables.
- First twisted pair (blue & white) must be used for A and B wires and a second twisted pair (black & red) must be used for 24V and GND.

Table 3-1 *Power Cable Options (24V and GND)*

Distance	Minimum wire gage	Minimum diameter	Minimum cross section
150 m (500 ft)	18 AWG	1.02 mm	0.82 mm^2
300 m (1000 ft)	16 AWG*	1.29 mm	1.30 mm^2
600 m (2000 ft)	14 AWG	1.62 mm	2.08 mm^2
900 m (3000 ft)	12 AWG	2.05 mm	3.30 mm^2
1200 m (4000 ft)	10 AWG	2.58 mm	5.26 mm^2

* Recommended

AP/Cumberland can provide sourced color-coded communication wire to install EDGE controls. The wire will be available in both 16 and 18 gauge to accommodate the specified distance between controls (as shown above). The communication wire is available in one or two twisted shielded pairs, and with two different outside jacket colors (red and black.) Black-jacketed wire is to be used for the automation circuit and red-jacketed wire is to be used for the safety circuit. Each of the communication wires is comprised of two or four unique colored wires to further reduce installation errors.



Power Cable Requirements	
Distance	Minimum Wire AWG
500' (150 m) *	18 AWG
1000' (300 m)	16 AWG
* Maximum distance between any two expansion boxes	

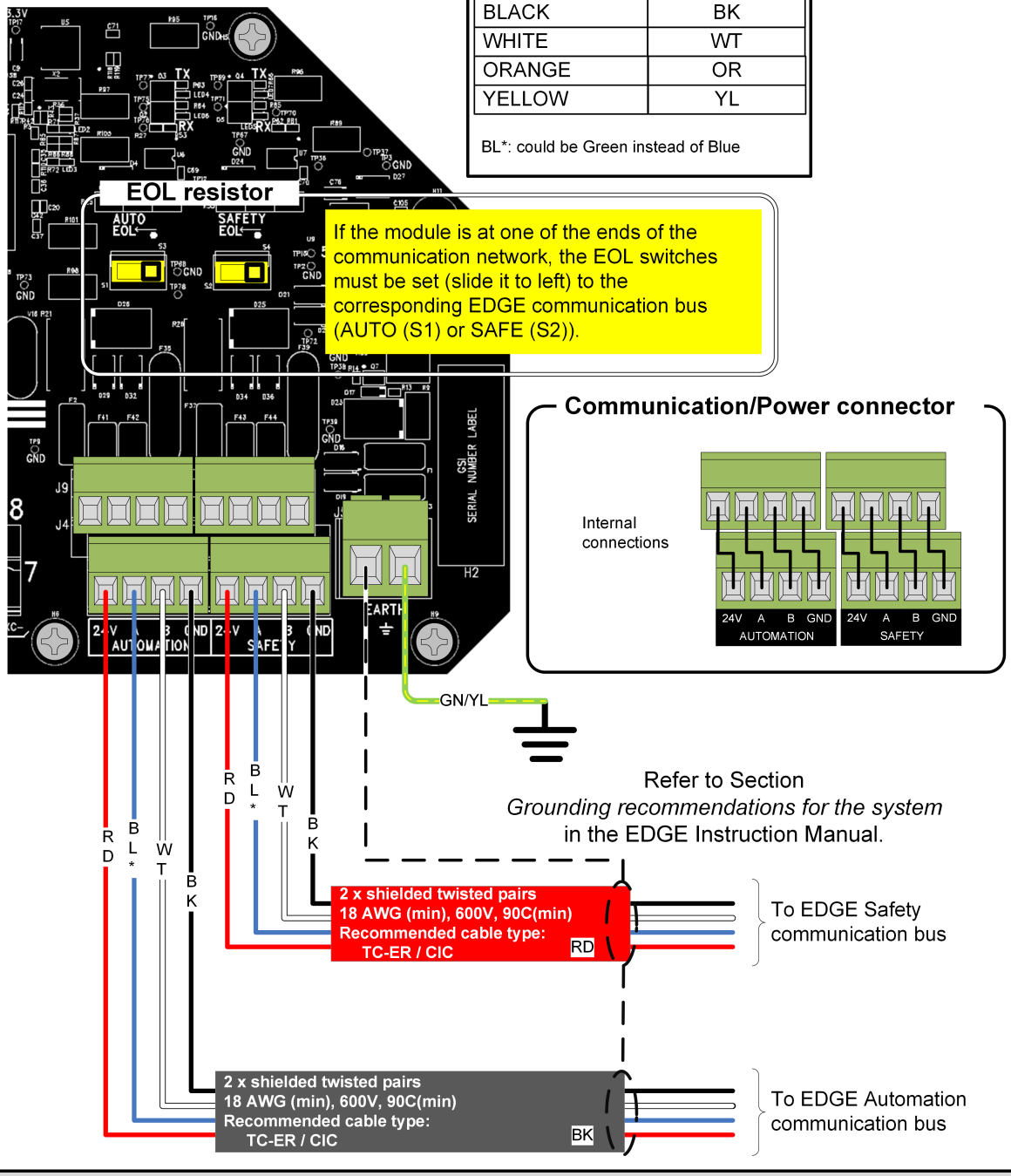
Communication Cable Requirements	
Distance	Minimum Wire AWG
4000' (1200 m) *	18 AWG
* Total Distance from first control to last control	

Item	Description	Lbs.	Kgs.
WR-16-1TS-S	Wire, 16 AWG 1 Twisted Shielded Pair, Comm & Power, 600V, 1000'/ Spool	44	20.00
WR-16-2TS-S	Wire, 16 AWG 2 Twisted Shielded PairS, Comm & Power, 600V, 1000'/ Spool	84	38.18
WR-16RED-1TS-S	Wire, 16 AWG 1 Twisted Shielded Pair, Comm & Power, 600V, Red Jacket, 1000'/Spool	44	20.00
WR-16RED-2TS-S	Wire, 16 AWG 2 Twisted Shielded PairS, Comm & Power, 600V, Red Jacket, 1000'/Spool	84	38.18
WR-18-1TS-S	Wire, 18 AWG 1 Twisted Shielded Pair, Comm & Power, 600V, 1000'/ Spool	25	11.36
WR-18-2TS-S	Wire, 18 AWG 2 Twisted Shielded PairS, Comm & Power, 600V, 1000'/ Spool	66	30.00
WR-18RED-1TS-S	Wire, 18 AWG 1 Twisted Shielded Pair, Comm & Power, 600V, Red Jacket, 1000'/Spool	25	11.36
WR-18RED-2TS-S	Wire, 18 AWG 2 Twisted Shielded PairS, Comm & Power, 600V, Red Jacket, 1000'/Spool	66	30.00

Figure 3-2 *Communication and Power Connections*

ABBREVIATIONS	
COLOR	**COLOR CODE**
RED	RD
BLUE	BL
GREEN/YELLOW	GN/YL
BLACK	BK
WHITE	WT
ORANGE	OR
YELLOW	YL

BL*: could be Green instead of Blue



NOTES :
Refer to *Low voltage cable specifications* in the EDGE Instruction Manual.

AP/Cumberland can provide sourced color-coded communication wire to install EDGE controls. The wire will be available in both 16 and 18 gauge to accommodate the specified distance between controls

Figure 3-3 *Daisy Chain Topology*

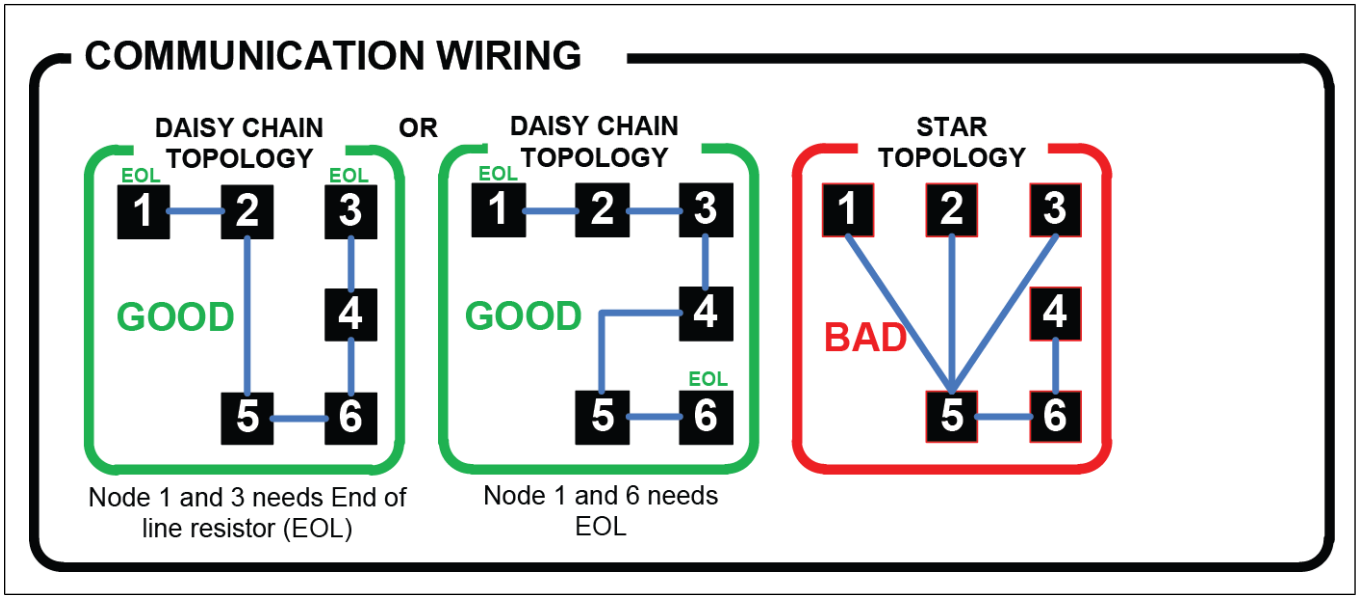
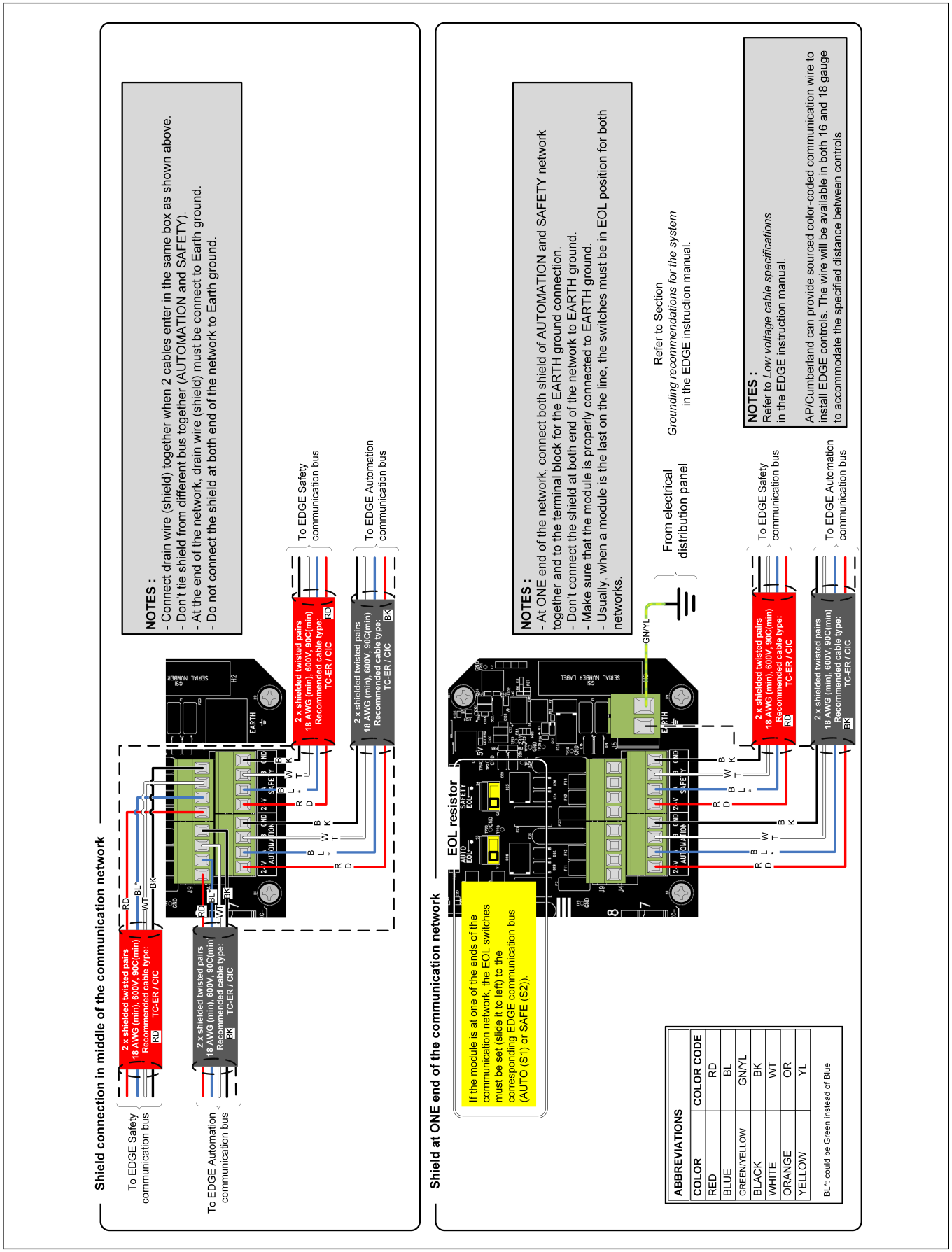
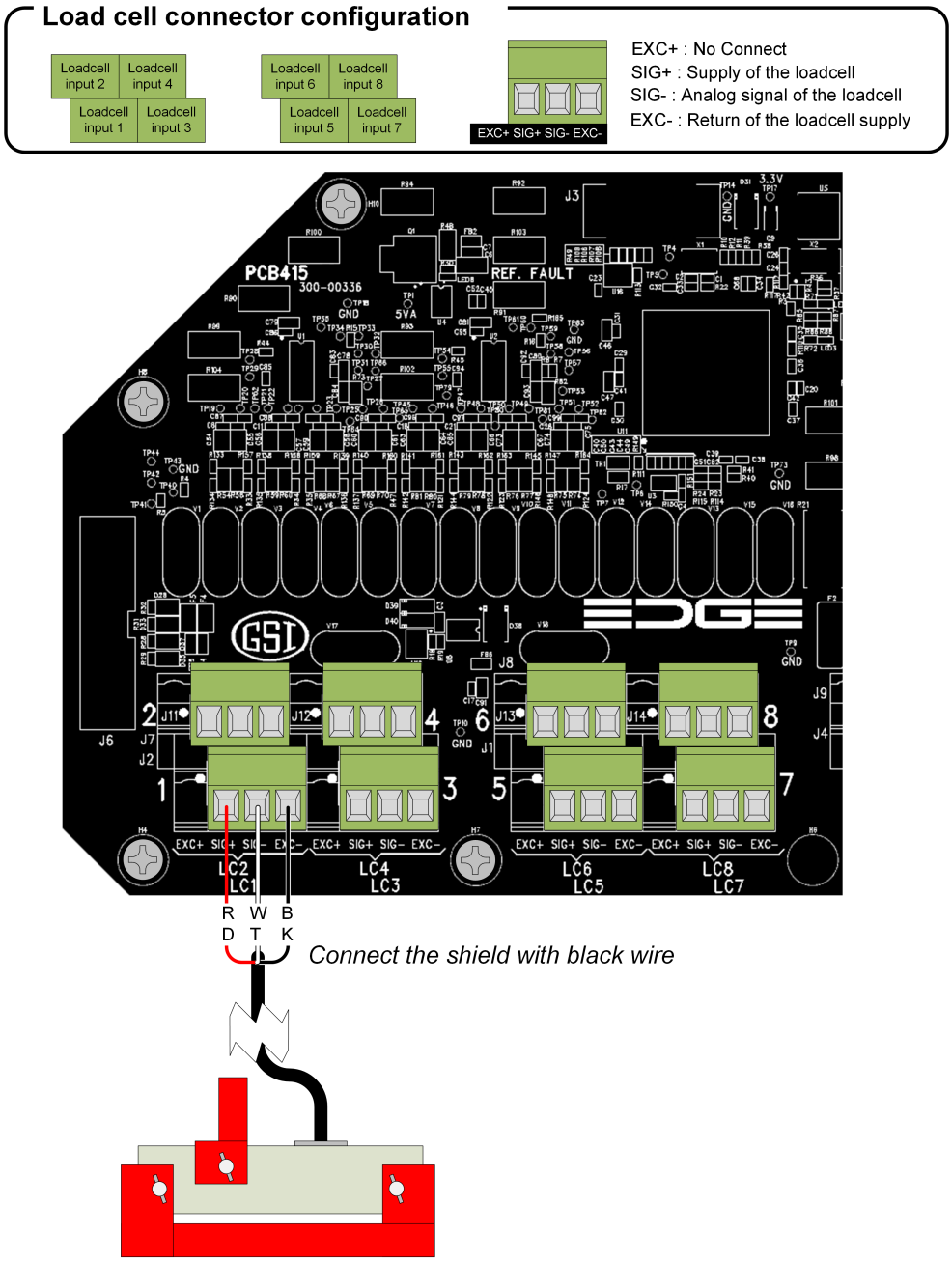


Figure 3-4 *Shield Connection*



EDGE Bin Scale 3 Wire LC TB Connections

Figure 3-5 *Terminal block connection*



ABBREVIATIONS	
COLOR	COLOR CODE
RED	RD
BLUE	BL
GREEN/YELLOW	GN/YL
BLACK	BK
WHITE	WT

Wire color represents common color for typical loadcell. The color can differ depending of the manufacturer.

COLOR	DESCRIPTION
RED	SIG+: Supply of the loadcell
WHITE	SIG- : Analog signal of the loadcell
BLACK	EXC- : Return of the loadcell

NOTES

4 Getting started

Topics Covered in this Chapter

- How it works
- Conditions of use and installation
- Scenarios

How it works

The Bin Scale System is a method of monitoring and managing on-site feed inventory either at the site or from a remote location. It can be adapted to new or existing facilities to provide accurate, real-time data regarding feed inventory levels and feed consumption.

The Bin Scale System is made up of the following:

- Load cells that are installed to the bottom of the bulk feed tank legs.
- *Bin Scale Module*.

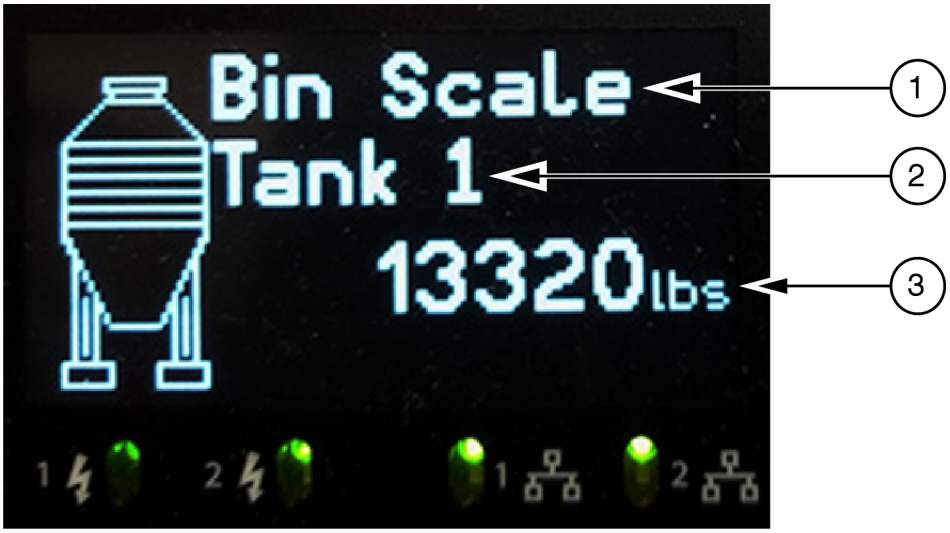
There are two types of load cells: the three wire (3W) and the four wire (4W). The two types use different technologies and generate different electrical signals. To match those technologies, two models of the Bin Scale Module are available:

- Bin Scale 3 Wires LC
- Bin Scale 4 Wires LC

A *Bin Scale Module* is equipped with an OLED display and should be installed onto the bulk feed tank leg. The module must be connected to an *EDGE Controller* and is referred to as an expansion box.

One *Bin Scale Module* can monitor up to eight load cells.

Figure 4-1 *Bin Scale Module Display*



Item	Field	Description
1	Expansion box name	Used to identify the *Bin Scale Module* on the bulk feed tank leg. The name is set by the user in the *EDGE Controller* system configuration.
2	Name	Used to identify the bulk feed tank that the *Bin Scale Module* is on. The name is set by the user in the *EDGE Controller* Bulk Feed Tank configuration.
3	Feed weight	Shows the weight of the feed currently in the bulk feed tank, after it has been calibrated. Before calibration, dashes are shown. When a single bulk feed tank is connected, the display continuously shows the weight of that bulk feed tank. When more than one bulk feed tank is connected, the display alternates between the bulk feed tanks every 2 seconds.

NOTE: *Bin Scale Modules and bulk feed tanks may be named in order to quickly identify the equipment.*

To configure and set up the *Bin Scale Module*, the user must use the *EDGE Controller* that is connected to the module.

Conditions of use and installation

- All legs should have its own load cell.
- Only three wires load cells type can be connected to a *Bin Scale 3 wires LC* model.
- Only four wires load cells type can be connected to a *Bin Scale 4 wires LC* model.
- For a given bulk feed tank:
  - only identical load cell type on all of its legs must be used. No mix is allowed;
  - all of its load cells must be connected to the same bin scale module.
- A bin scale module can be used for more than one bulk feed tank.
- Depending on the number of legs on a bulk feed tank, some bin scale inputs might not be used.

Scenarios

- Two bulk feed tanks with four legs each, can be connected to the eight inputs (four each) on the same *Bin Scale Module*.
- A six leg bulk feed tank must use one *Bin Scale Module*. The two remaining inputs will be unused, but they can be used as replacements in the case of an input failure on that bulk feed tank.
- An eight leg bulk feed tank must use one *Bin Scale Module*. In the case of an input failure, the module must be changed for a new one.

NOTES

5 Configuration

Topics Covered in this Chapter

- Configuring a Bulk Feed Tank
- Calibrating the Bin Scale

Configuring a Bulk Feed Tank

You have to configure a bulk feed tank in the *EDGE Controller* so the *Bin Scale Modules* can be properly identified and calibrated.

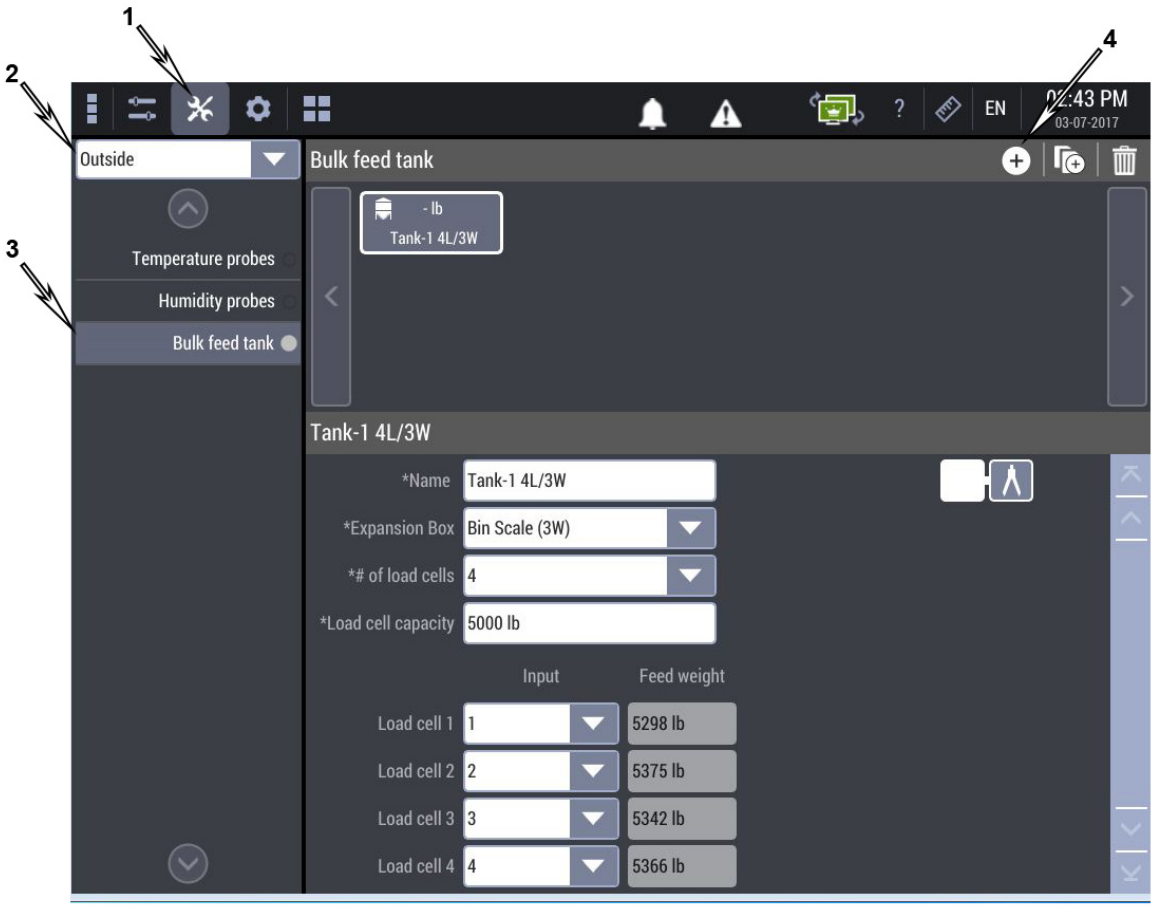
Before You Begin

- Make sure the load cells and *Bin Scale Modules* are installed correctly.
- Make sure all electrical connections are installed correctly.
- Make sure the software version used on the ***EDGE Controller* is 2.4.0 or higher**. See *EDGE Controller* user manual for more information on how to check the software version.
- Make sure that an outside service room has been setup. A bulk feed tank can only be configured in an outside service room. To configure an outside service room, see **Room/Barn configuration** in the *EDGE Controller* manual.
- Make sure that the *Bin Scale Modules* have been detected by the *EDGE Controller*. See the **Module detection** section in the *EDGE Controller* manual for more information.
- Make sure you know the name of the bulk feed tank and the *Bin Scale Modules*.

To add and configure a bulk feed tank:

1. Press the **Configure** icon  on the *EDGE Controller*.
2. Select **Outside** from the Room/Barn drop down menu.
3. Press **Bulk feed tank**.
4. Press the  button to add a new bulk feed tank or choose an existing bulk feed tank to modify.

Figure 5-1 *Bulk Feed Tank configuration screen (3W Load Cell)*



5. Set the following parameters:

Parameter	Description
Name	Used to identify the bulk feed tank.
Expansion Box	Select the *Bin Scale (3W) module* that is connected to the bulk feed tank.
# of load cells	Select the number of load cells installed on the bulk feed tank and connected to the *Bin Scale (3W) module* .
Load cell capacity	Enter the nominal weight capacity of one load cell. (All load cells must be identical.)
Load cell (x) Input	Select the inputs where the load cells are installed in the *Bin Scale (3W) module* . Numbering the bulk feed tank legs to match the board inputs will make trouble-shooting easier.

NOTE: *The Feed weight field displays the weight of the feed measured by the load cell. This only displays after a calibration has been performed.*

Calibrating the Bin Scale

The Bin Scale load cells must be calibrated before you can get an accurate feed weight reading. You calibrate the Bin Scale load cells using the *EDGE Controller.*

Before You Begin

Make sure each load cell reads a raw weight value and that those values are stable.

IMPORTANT: *The bulk feed tank must be stable at the time of calibration. For example, flow hammers, wind, passing vehicles, or trains can give and inaccurate reading and even some error message.*

NOTE: *You will need a feed load at least five times heavier than the empty bulk feed tank weight to perform the* ***Loaded tank calibration****.*

What You Should Know

There are two mandatory calibrations, an **Empty tank calibration (Tare)** and a **Loaded tank calibration**. It is not necessary to have a completely empty bulk feed tank to perform the **Empty tank calibration (Tare)** if you know the weight of the feed inside the bulk feed tank. A valid calibration requires both the **Tare** and **Loaded** operations to be completed successfully.

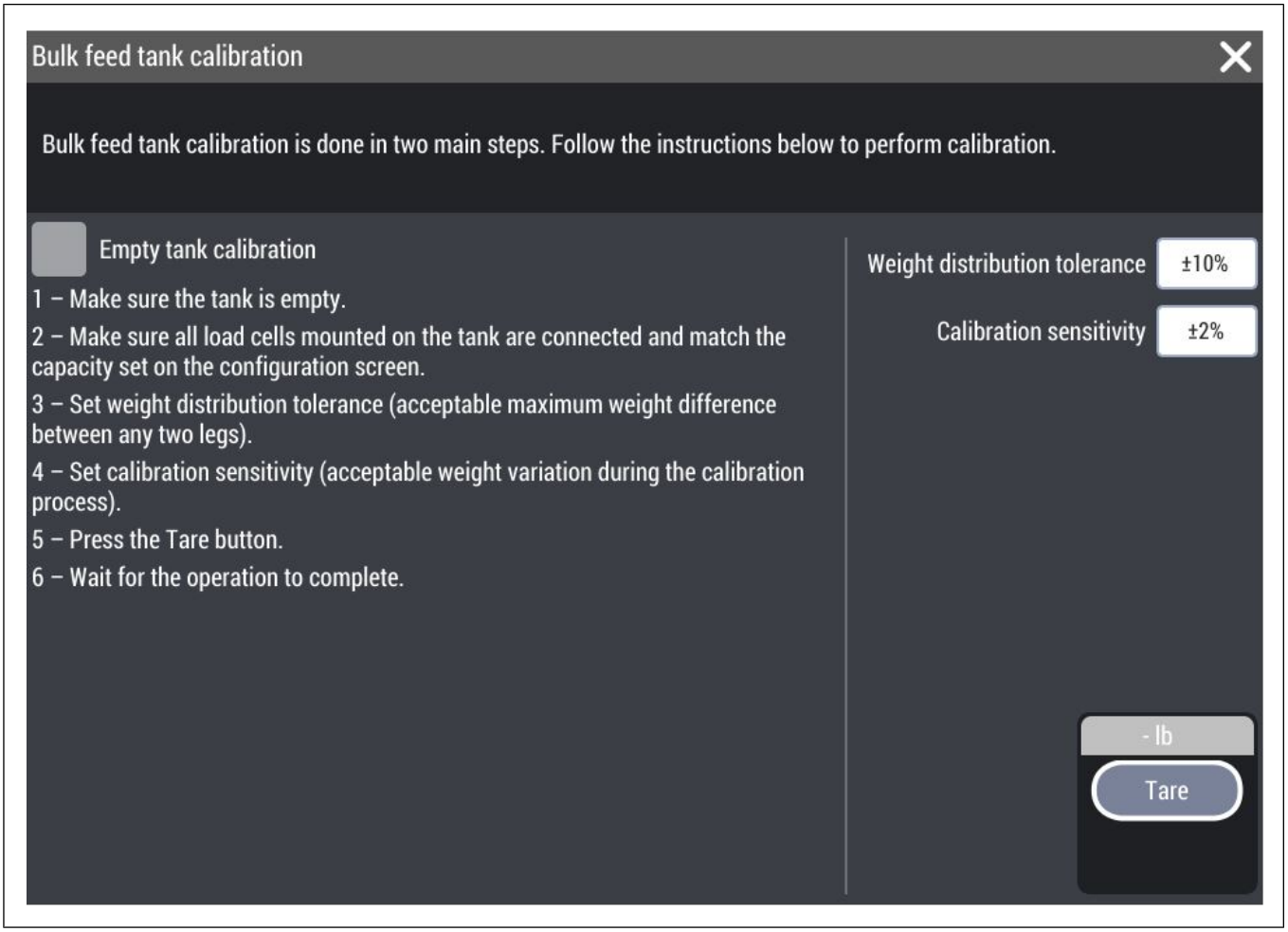
IMPORTANT: *Normally, you will have to wait for a feed delivery to be able to do the* ***Loaded tank calibration*** *After you complete an* ***Empty tank calibration (Tare)****, you can exit the screen without loosing the Tare calibration and finish the* ***Loaded tank calibration*** *later.*

To perform an Empty tank calibration (Tare):

1. In the *EDGE controller* click **Configure→Outside→Bulk Feed Tank** and select the bulk feed tank you want to calibrate.
2. Press the **Calibration** icon  .

   The **Bulk feed tank calibration** screen will be displayed.

Figure 5-2 *Empty Tank Calibration screen (Tare)*



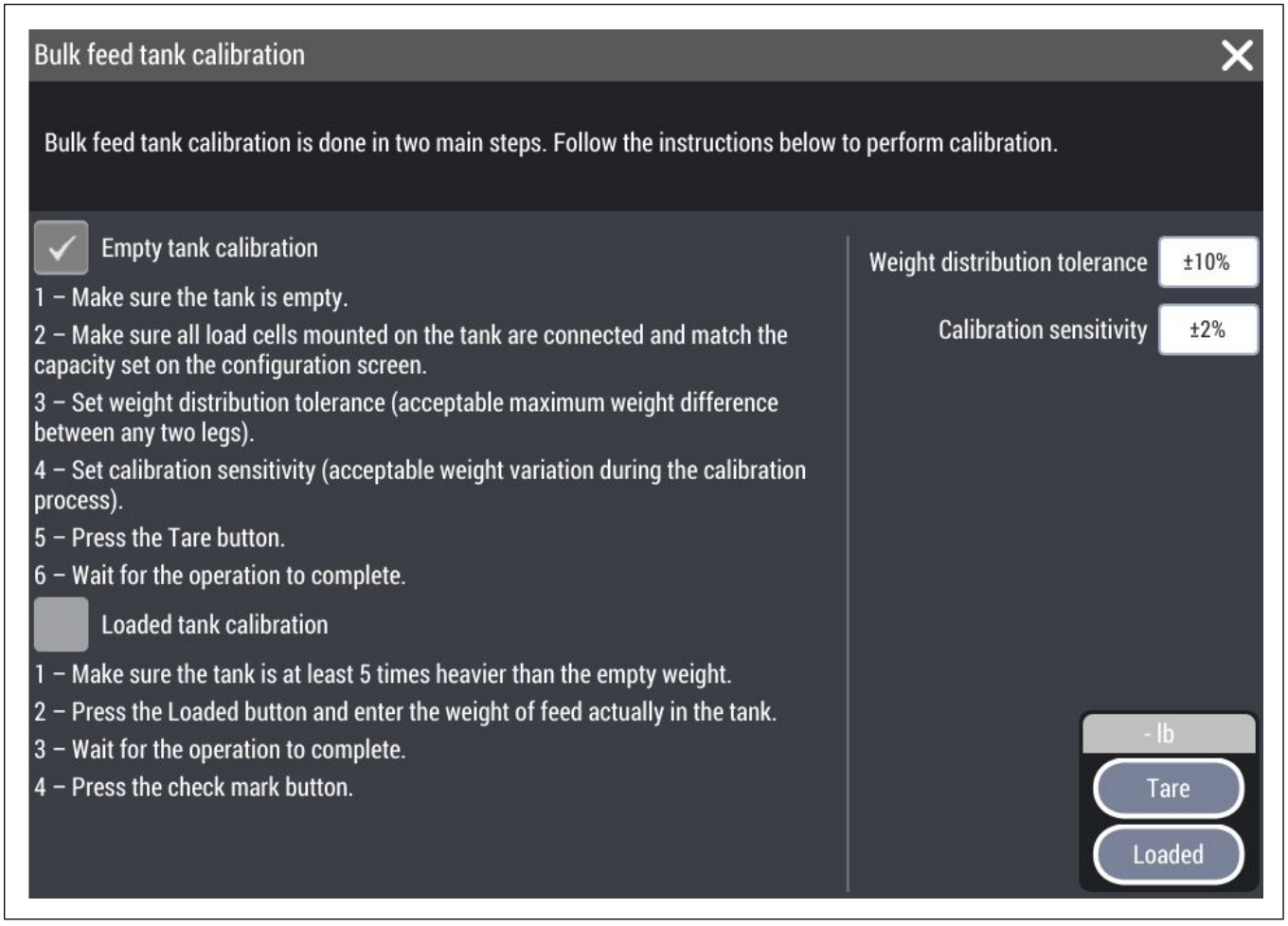
3. Follow the **Empty tank calibration** steps displayed on the screen.

   IMPORTANT: *All bulk feed tank legs should support an equal amount of the empty bulk feed tank weight. If not, refer to the chapter Installation / Leveling the bulk feed tank to correct the installation. If you can't correct the situation, you may increase the weight distribution tolerance % in step 3 but you will loose weight accuracy. Not suitable for installation with the EDGE Feed by weight feature.*

   IMPORTANT: *The bulk feed tank must be stable at the time of calibration. For example, flow hammers, wind, passing vehicles, or trains can give and inaccurate reading and even some error message. If you can't physically correct the situation, you may increase the Calibration sensitivity in step 4 but you will loose weight accuracy. Not suitable for installation with the EDGE Feed by weight feature.*

   When the Tare calibration is complete, the **Empty tank calibration** field is checked and the instruction for the **Loaded tank calibration** appears.

Figure 5-3 *Loaded Tank Calibration screen (Loaded)*



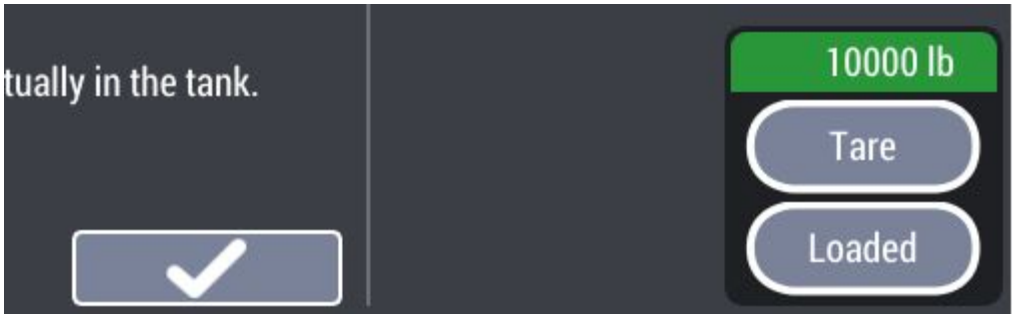
To perform a Loaded Tank Calibration (Loaded):

4. Follow the **Loaded tank calibration** steps displayed on the screen.

   NOTE: *The **Loaded tank calibration** operation is only accessible after a successful **Empty tank calibration**.*

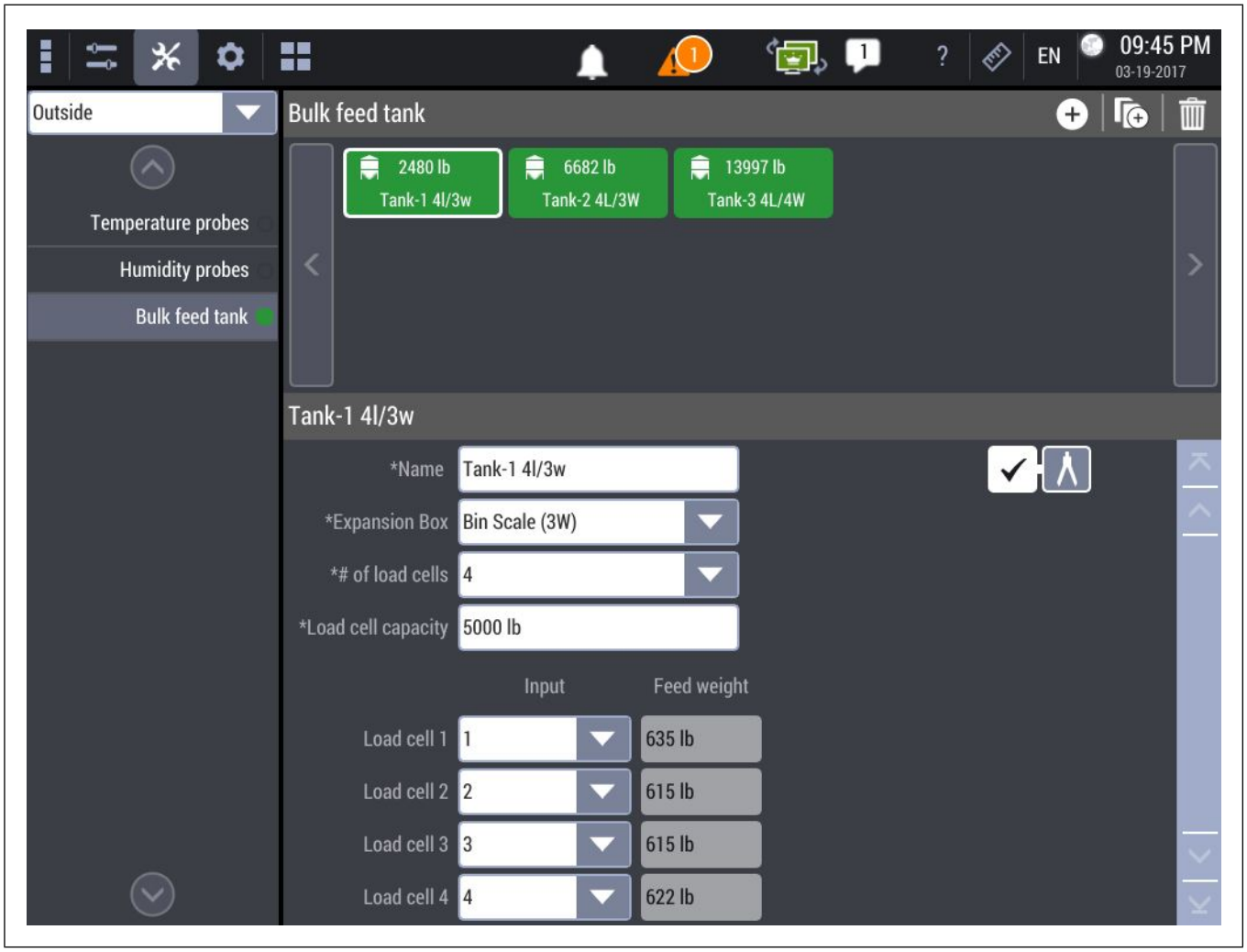
5. When the **Loaded tank calibration** is complete, press the **OK** button  to accept the calibration.

Figure 5-4 *Ok button*



The display will return to the configuration screen and there will be a check mark next to the calibration icon.

Figure 5-5 *Successful calibration*



6 Setup

Topics Covered in this Chapter

- Setting up a Bulk Feed Tank
- Setting up a Tank group
- Setting an Out of Feed Alarm

Setting up a Bulk Feed Tank

From the *EDGE Controller*, you can set the parameters for each bulk feed tank.

To setup the bulk feed tank parameters:

1. Press the **Setup** icon  on the *EDGE Controller*.
2. Select **Outside** from the Room/Barn drop down menu.
3. Press **Bulk feed tank**.
4. Select **Room Setup**.
5. Select the tile of the **Bulk feed tank** that you want to setup.

   NOTE: *The bulk feed tank tile shows the name of the bulk feed tank and the current feed weight in the bulk feed tank.*

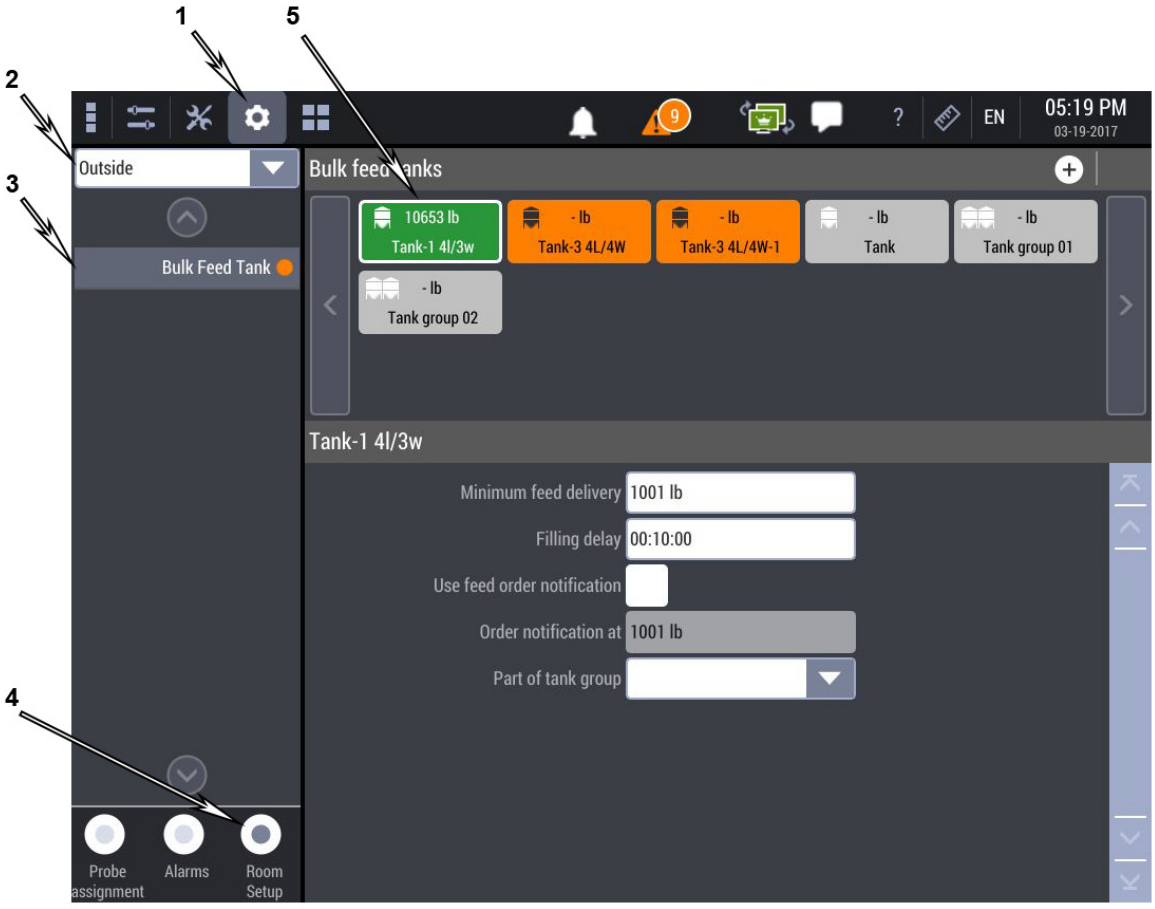
6. Set the the following parameters:

Parameter	Description
Minimum feed delivery	The minimum feed weight added to the bulk feed tank to be considered as a feed delivery. Any added weight under this entered value will not trigger a feed delivery notice.
Filling delay	The maximum time between feed weight increments to be considered as a single delivery. A weight increment will start a countdown with the entered value. If a new increment is detected, it will reset the countdown. If no increment is detected before the end of the countdown, the feed delivery will be considered complete and a delivery notice will be sent.
Use feed order notification	Check this field if you want to be notified when it's time to order feed for this bulk feed tank.

Parameter	Description
Order notification	If the above *Use feed order notification* is checked, enter the feed weight value to trigger the notification. The notification icon will flash with a number in it and a notification will be sent to the selected contacts. For more information, see the **User management** section in the *EDGE Controller* manual.
Part of tank group	Appears only if at least one **tank group** is already configured. Select the tank group from the drop down list if you want this bulk feed tank added to tank group. See **Setting up a tank group** section in this manual.

If the **Use feed order notification** is active (checked), you can create an account for your feed supplier by selecting the option **Receives feed order notifications** from the **User management** menu. See **User management** section in the *EDGE Controller* user manual for more information.

Figure 6-1 *Bulk Feed Tank setup screen*



Setting up a Tank group

You can group specific bulk feed tanks together in the EDGE software for easier management of feed consumption.

What You Should Know

Managing feed in livestock buildings is complex. Each site is different and the system is constantly re-configured to suit the immediate needs of the producer and his animals. Tank groups can be used to track and monitor feed usage. You can match an auger to a bulk feed tank or a tank group in the **Feed grid** interface. See the **Feed grid** section in the *EDGE Controller* manual for more information.

By definition, a tank group is a set of bulk feed tanks monitored as a single feed consumption measurement and for which notifications and alarms can be set. Bulk feed tanks in a group can be removed for specific, short term needs, then grouped back.

To setup a Tank group:

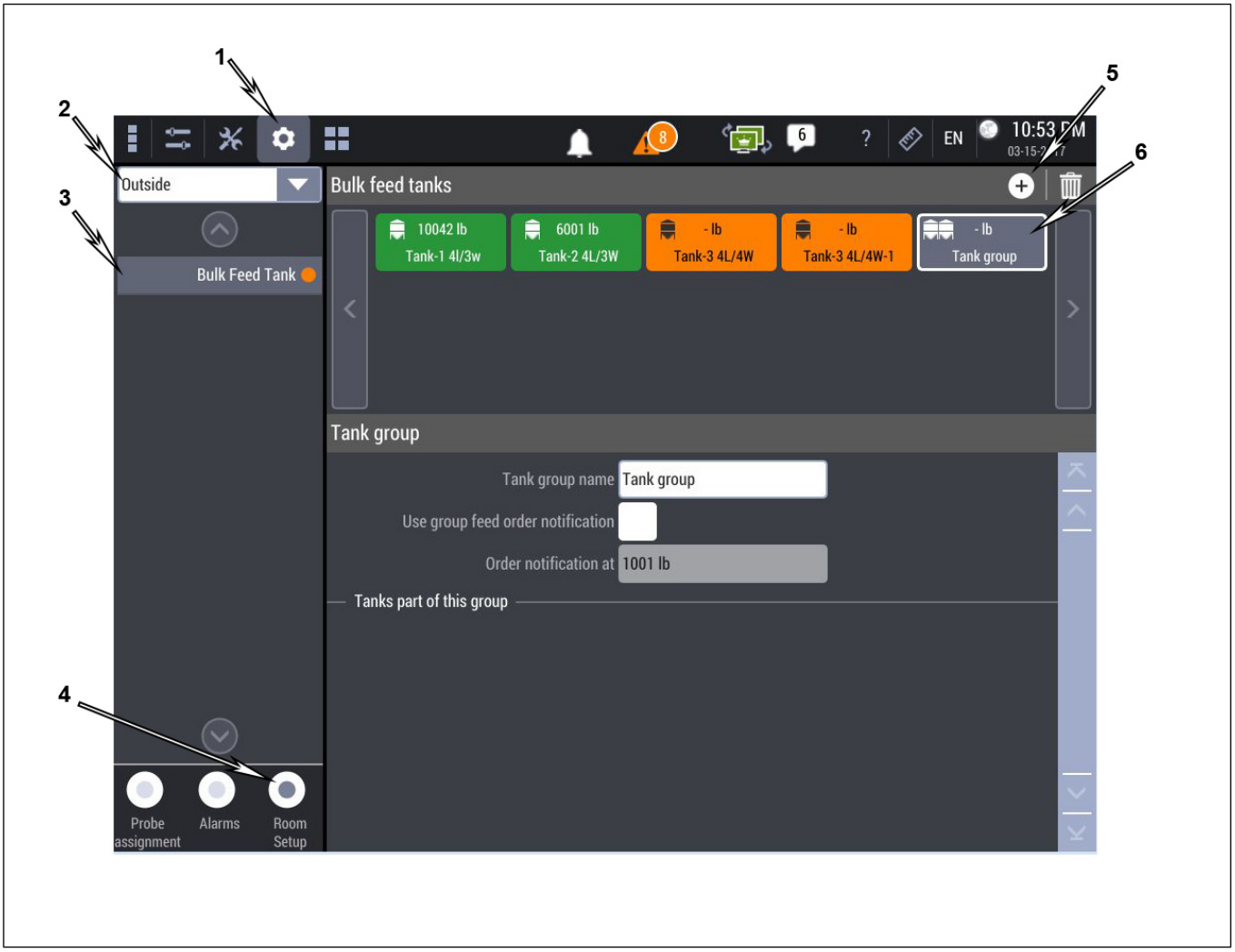
1. Press the **Setup** icon  on the *EDGE Controller*.
2. Select **Outside** from the Room/Barn menu.
3. Press **Bulk feed tank**.
4. Select **Room Setup**.
5. Press the **Add** button  to add a new group or select a **Tank group** to modify.

   NOTE: *A Tank group tile shows two bulk feed tank icons, the name of the tank group, and the current feed weight of all the bulk feed tanks in the group.*
6. Set the following parameters:

Parameter	Description
Tank group name	The name for identifying this bulk feed tank group.
Use group feed order notification	Check this field if you want to be notified when it's time to order feed for this bulk feed tank group.
Order notification at	If the above **Use group feed order notification** is checked, enter the feed weight value to trigger the notification.

NOTE: *To add or remove a bulk feed tank from a **Tank group**, see Setting up a Bulk Feed Tank.*

Figure 6-2 *Tank group setup screen*



Setting an Out of Feed Alarm

An **Out of feed alarm** can be associated with a single *Bulk feed tank* or a *Tank group*. Both are configured the same way.

What You Should Know
An **Out of feed alarm** can be set up to trigger:

- an alarm in the alarm page,
- the EDGE Controler main alarm relay,
- a specific alarm relay.

When used, an **Out of feed alarm** is triggered for a bulk feed tank or a tank group when the feed weight drops below the **Out of feed alarm threshold**. It will recover when feed is added to the bulk feed tank or when doing a **Tare weight calibration**.

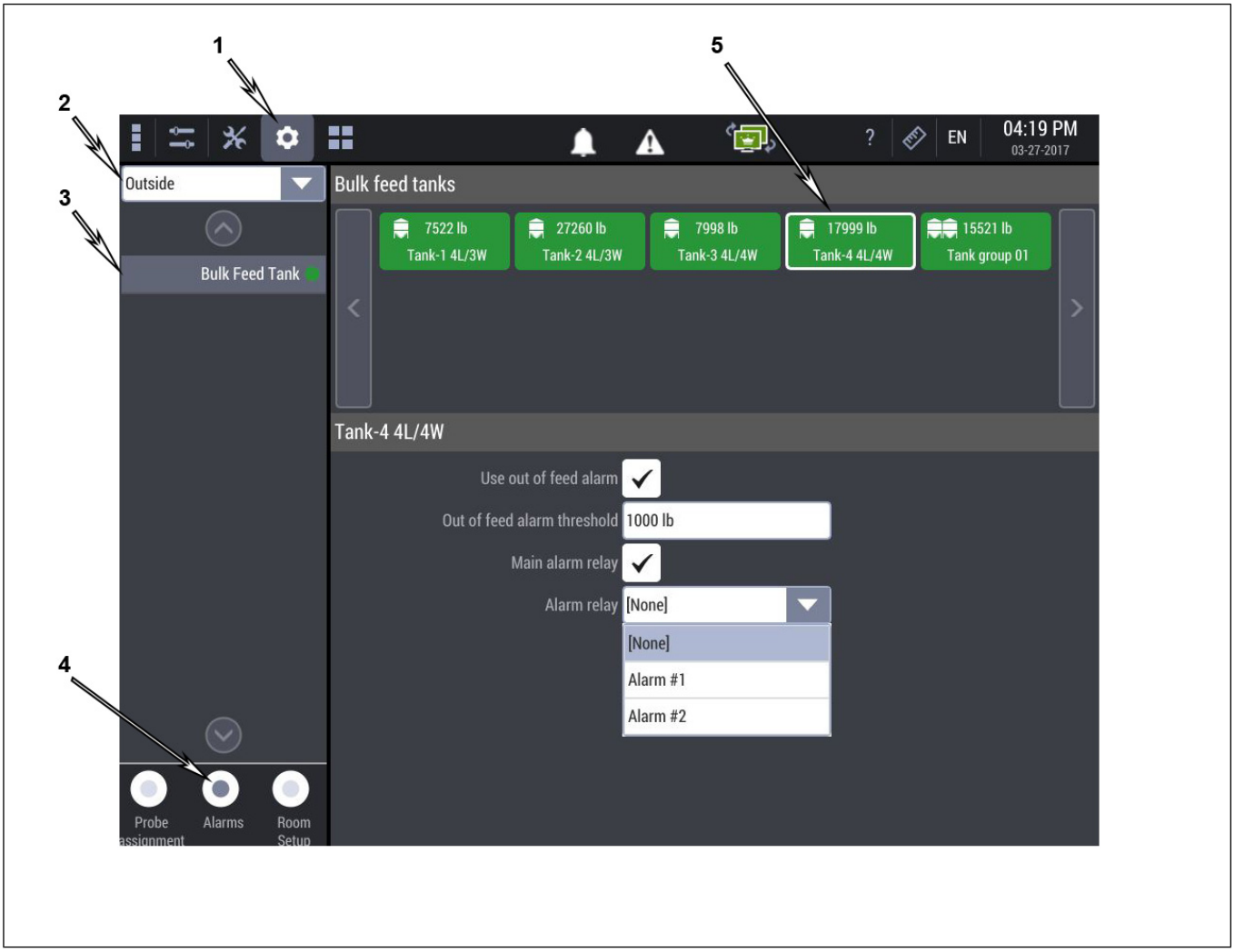
To set an Out of Feed Alarm:

1. Press the **Setup** icon  on the *EDGE Controller*.
2. Select **Outside** from the Room/Barn menu.
3. Press **Bulk feed tank**.
4. Select **Alarms**.
5. Select the desired **Bulk Feed Tank** or **Tank group**.
6. Set the parameters the following parameters:

Parameter	Description
Use out of feed alarm	Check to turn **ON** or uncheck to turn **OFF** the out of feed alarm.
Out of feed alarm threshold	Set the feed weight below which the **Out of feed alarm** will be triggered.
Main alarm relay	Check if you want the **EDGE Controller Main alarm relay** to be triggered by an **Out of feed alarm**. See the **Main alarm relay** section in the *EDGE Controller* manual for more information.
Alarm relay	A specific alarm relay may be triggered by the **Out of feed alarm**. See the **Alarm relay** section in the *EDGE Controller* manual for more information.

NOTE: *The **Out of feed alarm** can be sent to predefined users. See how to setup this feature in the **User management** section of the EDGE Controller manual.*

Figure 6-3 *Out of feed alarm setup screen*



7 Operation

Topics Covered in this Chapter

- Operation

Operation

Operation of the bin scale system must be done from the *EDGE controller*.

What You Should Know
Weighing bulk feed tanks will allow users to know feed inventory, feed consumption, and help in the planning of feed ordering.

To get to the Bulk Feed Tank screen:

1. Press the operations icon  .
2. Press the bulk feed tank icon  in the *EDGE Controller* operation page.

   This page is where the user can get information on the feeding system for the whole site.

Figure 7-1 *Bulk Feed Tank operation page*

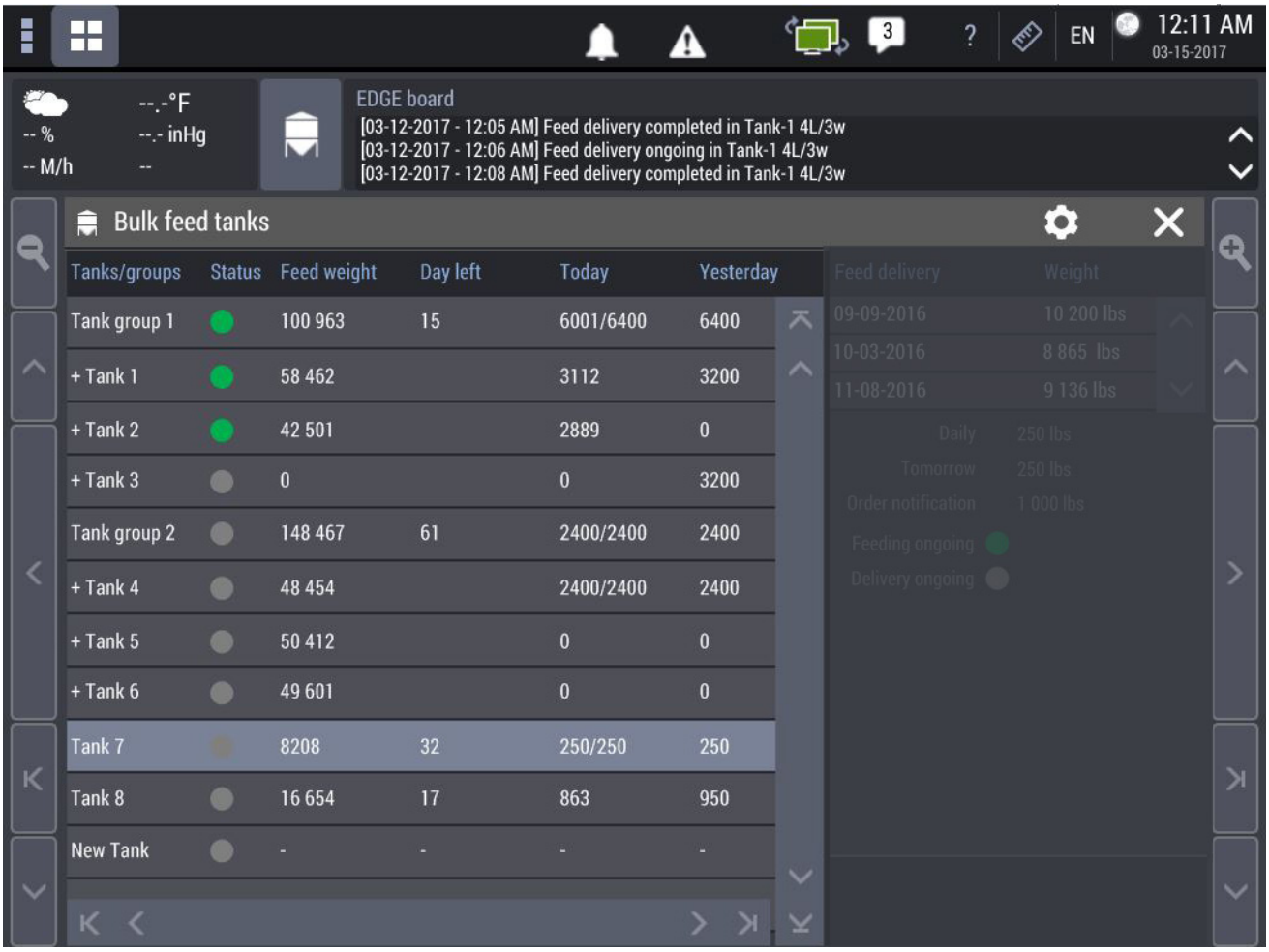


Table 7-1 *Bulk Feed Tank page fields*

Field	Description
	Opens the bulk feed tank setup of the selected bulk feed tank or tank group.
Bulk feed tanks/groups	Bulk feed tank and tank group names as set during configuration and setup. Bulk feed tanks within a group are indented under the tank group name. There is one line for each tank group.
Status	Grey - no feed removed from this bulk feed tank or tank group. Green - feed removed from this bulk feed tank or tank group. Trouble and alarm icons are displayed next to the status LED when a bulk feed tank experiences a trouble or an alarm condition.
Feed weight	Actual feed weight in the bulk feed tank. For a tank group, total feed weight of all the bulk feed tanks in the group.
Day left	Number of days from current date to empty the bulk feed tank or tank group. **NOTE:** The system needs at least one day of feed usage to do an estimate. The

Table 7-1 *Bulk Feed Tank page fields (cont'd.)*

Field	Description
	last three days are used to predict the future feed usage and thus the number of days left.
Today (value1 / value2)	(1) Actual feed weight pulled from the bulk feed tank or tank group since mid-night / (2) Expected feed usage for today.
Yesterday	Feed weight pulled from the bulk feed tank or tank group yesterday.
	Pressing right or left arrows at the bottom of the page give access to feed usage history for up to seven days.

Bulk Feed Tank may be configured as a single unit or part of a *Tank Group*. The information in the right pane is contextual to the selection made in the left pane whether it is:

- a single *Bulk Feed Tank*,
- a *Bulk Feed Tank* within a group
- or a *Tank Group*.

NOTE: *The system has an Auto Tare feature. If the tare calibration of a bulk feed tank was done with feed in it and the entered feed weight was lower than the actual weight, it is possible to get a negative weight. In this case, the feed weight on screen will display zero (never a negative value) until the next feed delivery. The measured bulk feed tank weight at the beginning of this feed delivery will become the new empty bulk feed tank weight replacing the tare calibration value. The empty bulk feed tank weight, feed weight and total weight will be adjusted accordingly.*

EXAMPLE: *A successful tare calibration on a bulk feed tank gives the following results on screen:*

- *Empty tank : 2000 lbs*
- *Feed weight : 1000 lbs*
- *Total weight : 3000 lbs*

User estimation of feed at calibration was inaccurate. After a feeding ongoing event, the total bulk feed tank weight dropped to 1500 lbs which represents -500 lbs of feed. On the controller, the readings will be:

- *Empty tank : 1500 lbs*
- *Feed weight : 0 lbs*
- *Total weight : 1500 lbs*

A feed delivery of 10 000 lbs occurs. On the controller, the readings will be:

- *Empty tank : 1500 lbs*
- *Feed weight : 10 000 lbs*
- *Total weight : 11 500 lb*

The auto tare feature re calculates the empty bulk feed tank weight each time the bulk feed tank gets empty which replaces the tare calibration value.

Single Bulk Feed Tank operation pane

Figure 7-2 *Single Bulk Feed Tank operation pane*

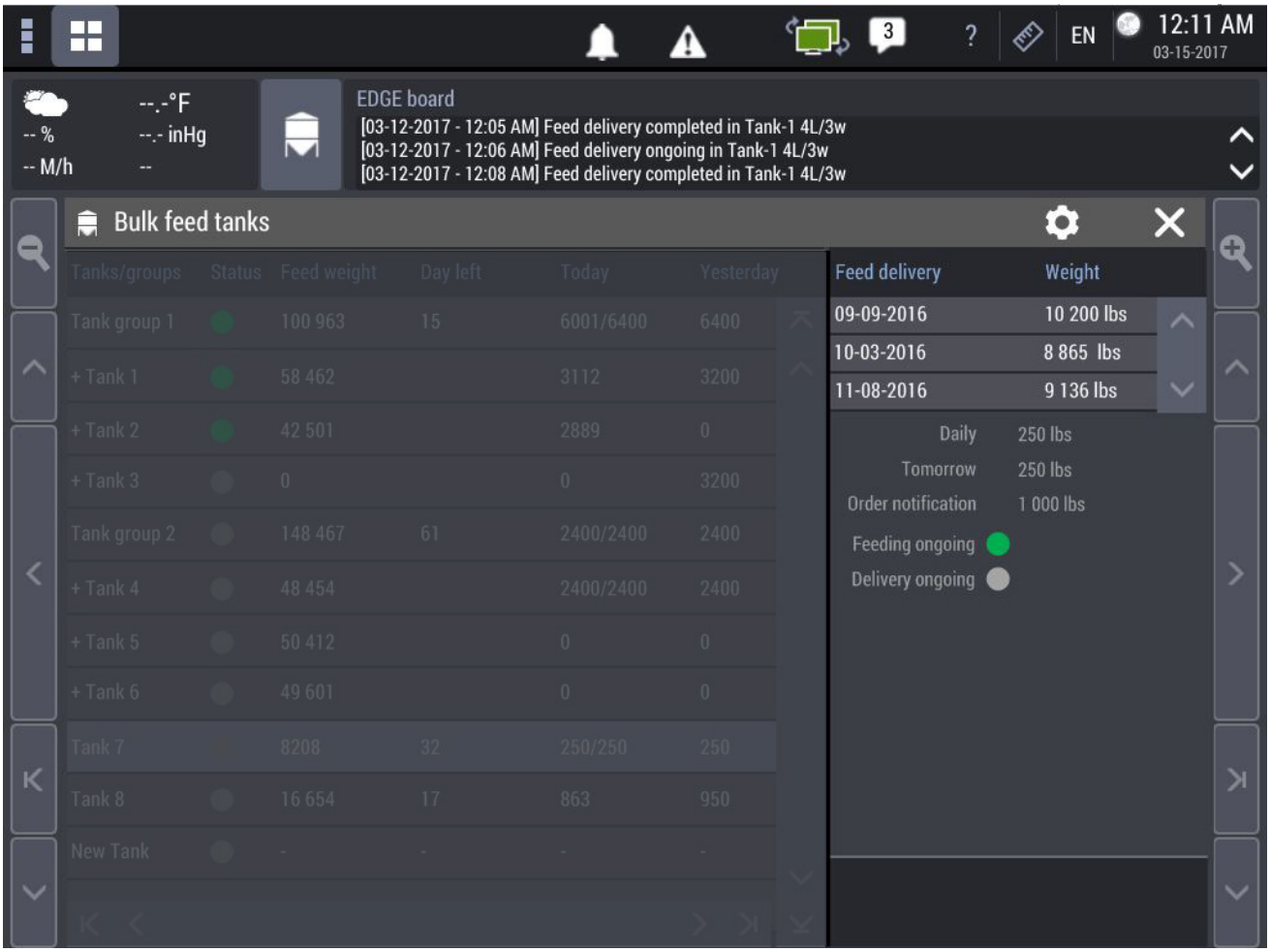


Table 7-2 *Single bulk feed tank page fields*

Field	Description
Feed delivery (see note 1)	History of the feed delivery for the selected *Bulk Feed Tank* or *Tank Group*, up to 50 deliveries or 180 days.
Weight (see note 1)	Feed weight delivered for this specific feed delivery.
Daily (see note 2)	Calculated daily usage for the selected *Bulk Feed Tank* or *Tank Group.*
Tomorrow (see note 2)	Expected feed usage from the selected *Bulk Feed Tank* or *Tank Group* for tomorrow
Order notification	Feed weight at which an order notification is issued for the selected *Bulk Feed Tank* or *Tank Group*.
Feeding ongoing	Grey - no feed removed from the selected *Bulk Feed Tank* or *Tank Group*. Green - feed removed from the selected *Bulk Feed Tank* or *Tank Group*.

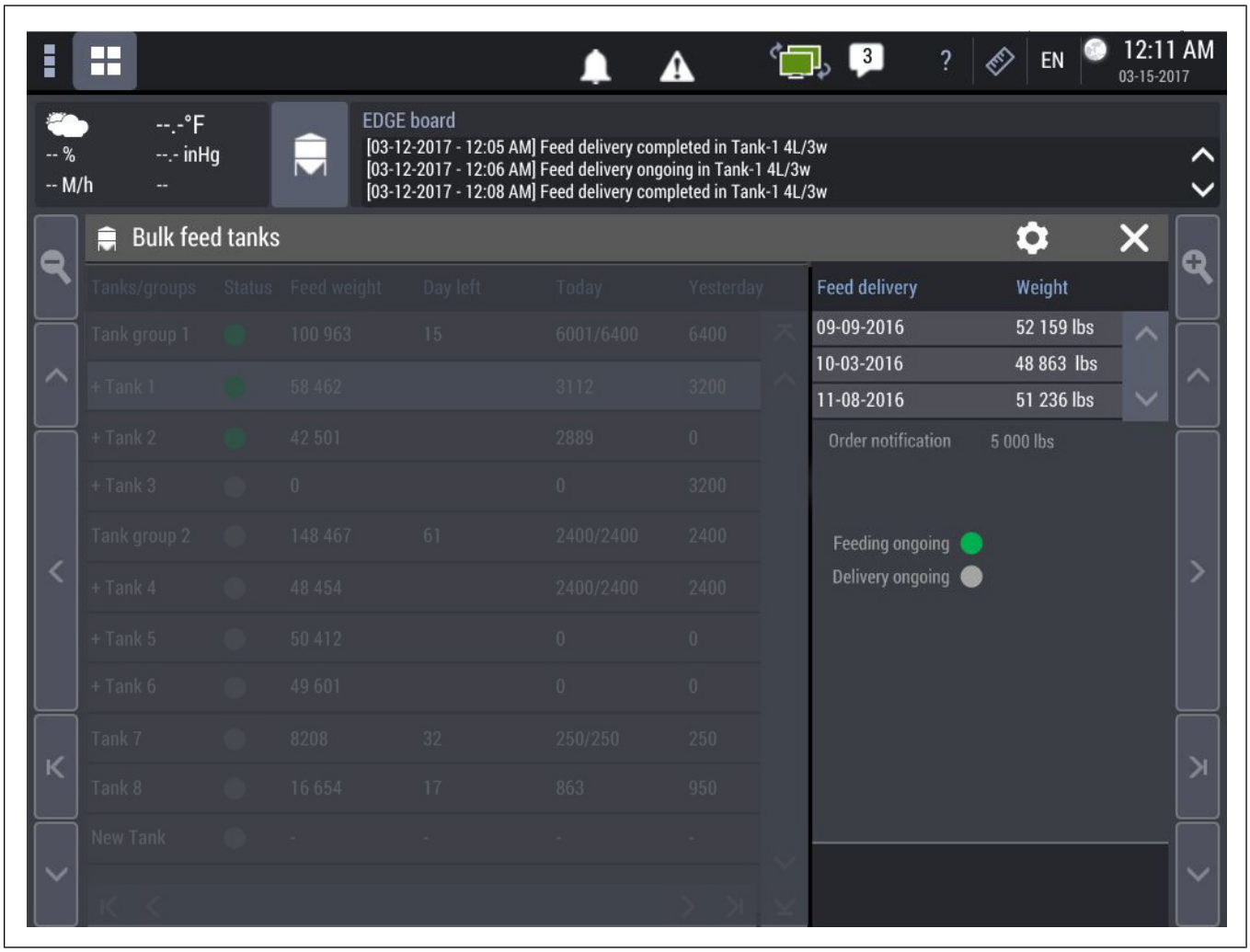
Table 7-2 *Single bulk feed tank page fields (cont'd.)*

Field	Description
Delivery ongoing	Grey - no feed delivery ongoing for the selected *Bulk Feed Tank* or *Tank Group*. Green - feed is being delivered (added) in the selected *Bulk Feed Tank* or *Tank Group*.
(note 1) Not present when a *Tank Group* is selected. (note 2) Not present when a *Bulk Feed Tank* in a *Tank Group* is selected.	

Bulk Feed Tank within a Tank Group operation pane

This pane shares the same fields with the single *Bulk Feed Tank* pane without the *Daily* and *Tomorrow* fields.

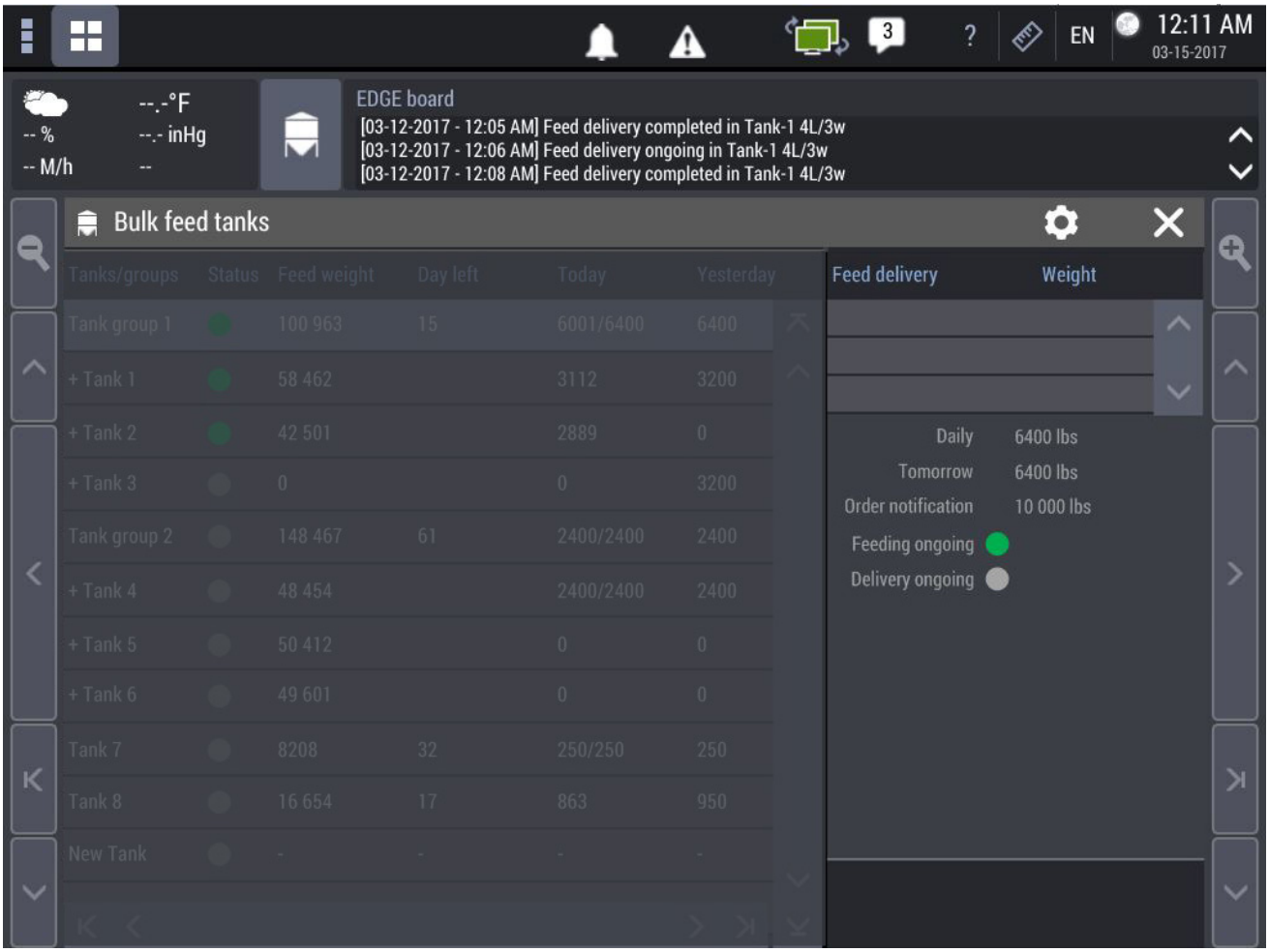
Figure 7-3 *Bulk feed tank in a tank group operation pane*



Tank Group operation pane

This pane shares the same fields with the single *Bulk Feed Tank* without the *Feed delivery* and *Weight* fields.

Figure 7-4 *Tank group operation pane*



8 Maintenance

Topics Covered in this Chapter

- Inspecting and cleaning the enclosure
- Inspecting and tightening the connections
- Replacing a Removable Component

Inspecting and cleaning the enclosure

Inspecting the enclosure and keeping them clean can help prolong the proper functioning of the module.

Before You Begin

CAUTION

Disconnect the voltage supply before servicing or performing any maintenance operations.

WARNING

Secure the screws on the enclosure once the wiring is completed or when servicing.

- Every few months, open and inspect the enclosure for moisture or dust build-up.

  WARNING

  Only maintenance personnel and service personnel can do that.

- Using a damp cloth, wipe clean the exterior of the enclosure.

  WARNING

  Do not pressure wash the controller.

Inspecting and tightening the connections

At some point, the electrical connections must be verified to ensure the connections are not loose and the installation is always safe. The inspection ensures that no overheating occurs on the electrical connections.

AP/Cumberland recommends the connections on power and control terminals to be verified every 3-12 Months. Look at the different paragraphs inside the manual to know what tightening torque is required according to the specific terminal.

WARNING

Only maintenance and service personnel can do that.

Replacing a Removable Component

NOTICE

There are no removable components in the EDGE Weather Station as a fuse.

9 Troubleshooting

Problem	Solution
The EDGE Bin Scale does not communicate	Verify if the EDGE Bin Scale is powered up
	Verify if there are activity on the bus communication by looking at the activity of the LEDs: LED4, LED5, LED6, LED7 on the PCB-415 inside the EDGE Bin Scale or by looking at the LEDs on the OLED Display of the EDGE Bin Scale
	Verify if the network link is installed correctly: Terminal A from EDGE Bin Scale to the controller terminal A, Terminal B from EDGE Bin Scale to the controller terminal B
	Verify if the network communication is installed in daisy chain.
	Verify if your end of line (EOL) switches are set correctly on your network
	Verify if the network link has been severed or the protections have been activated.
	Verify if there is not a short-circuit on the network link between terminal A and B
	Verify if the network link length is below 4000 feet (1200m) with the recommended wire gauge.
	Measure the voltage between the terminal 24V and GND on the EDGE Bin Scale terminals. The voltage must be at least 16V
	If the problem persists, contact AP/Cumberland or GSI Electronics
The EDGE Bin Scale does not power up	Verify if the LED "5V" is activated on the PCB-415 inside the EDGE Bin Scale or by looking at the LEDs on the OLED Display of the EDGE Bin Scale
	Measure the voltage between the terminal 24V and GND on the EDGE Bin Scale terminals. The voltage must be at least 16V
	Verify if the power link is installed correctly: Terminal 24V from EDGE Bin Scale to the controller terminal 24V, Terminal GND from EDGE Bin Scale to the controller terminal GND
	Verify if the power link has been severed.
	Verify if the power link length is below 300 feet (1000m) with the recommended wire gauge.
	If the problem persists, contact AP/Cumberland or GSI Electronics
Issues with the voltage output to power the load cell (LC(x) - SIG+ and LC(x) – EXC-)	Verify if the load cell wiring is correct according to the wiring diagrams
	Verify if the load cell is connected at the right terminals
	Verify if the LED “REF. OC. FAULT” on PCB-415 inside the EDGE Bin Scale is activated, there is an overload at the output LC(x) - SIG+
	Verify if the load cell link has been severed.
	Verify if the load cell is good: The voltage must be higher than 0,3V
	Verify if the load cell link length is below 50 feet (15m) with the recommended wire gauge.

	Verify if there is not a short-circuit on the terminal or on the load cell
	If the problem persists, contact AP/Cumberland or GSI Electronics
Issues with inputs readings (LC(x) – SIG- and LC(x) – EXC-)	Verify if the load cell wiring is correct according to the wiring diagrams
	Verify if the load cell is connected at the right terminal
	Verify if the LED “REF. OC. FAULT” on PCB-415 inside the EDGE Bin Scale is activated, there is an overload at the output LC(x) - SIG+
	Verify if the load cell link has been severed.
	Verify if the load cell link length is below 50 feet (15m) with the recommended gage
	Verify if the load cell is good: The voltage must be higher than 0,3V
	If the problem persists, contact AP/Cumberland or GSI Electronics
The weight reading is not accurate (too high or too low) Alarms or troubles messages like: Load cells reads a significant higher / lower weight than other load cells on the tank.	See “Issues with inputs readings”
	The bulk feed tank has been calibrated with the load cell sensitivity not set properly. Re-calibrate this Bulk feed tank with proper load cell sensitivity.
	Verify if there is a load cell on each bulk feed tank leg?
	Verify if the load cells are free of debris, ice, etc.
	Verify if the load cells are damaged. If so, replace the damaged load cell.
	Verify if the load cell mounting brackets are fastened securely .
	If the problem persists, contact AP/Cumberland or GSI Electronics
The weight reading never changes	See “Issues with inputs readings”
	Calibration was not done properly. Re-calibrate.
	Verify if the load cells are free of debris, ice, etc.
	Verify if the load cell mounting brackets are securely fastened.
	Verify for damaged or defective load cells . If so, replace.
	If the problem persists, contact AP/Cumberland or GSI Electronics
The weight reading is affected by thunder storm	The grounding of the bulk feed tank legs is incorrect. Refer to the mounting drawing to know more about the ground strap installation.
Trouble message: A load cell reached maximum weight (meaning: load cell is overloaded).	The bulk feed tank has been overfilled. Remove feed from tank.
	Verify that the load cell capacity setting match the installed load cells.
	The load cell capacity is too small for the size of the bulk feed tank. Replace with higher capacity load cells.
	The feed weight is not distributed evenly in the bulk feed tank.
	Verify if the load cell is free of debris, ice, etc.
	Verify if the load cell mounting brackets are securely fastened.
	Verify if the load cell is damaged. If so, replace the damaged load cell.
	Do the verification at the problem “Issues with inputs readings”
	If the problem persists, contact AP/Cumberland or GSI Electronics
Trouble message: The bulk feed tank weight is [value] of	Too much feed in the bulk feed tank (Did you receive a feed load recently?)
	Verify if the load cells are free of debris, ice, etc.

maximum. Check bulk feed tank level	Verify if the load cell mounting brackets are securely fastened.
	See “Issues with inputs readings”
	Verify that the load cell capacity setting match the installed load cells.
	The load cell capacity is too small for the size of the bulk feed tank. Replace with higher capacity load cells.
	If you didn’t receive a feed load recently and the bulk feed tank is not overfilled, the calibration is maybe wrong. Re-calibrate.
	If the problem persists, contact AP/Cumberland or GSI Electronics
Calibration pop-up error message: Weight distribution tolerance exceeded (meaning: too much difference between legs (load cells) weight)	The feed weight is not distribute evenly in the bulk feed tank.
	Verify if the load cells are free of debris, ice, etc.
	Can happen on a windy day or when earth trembles at a passage of a train / heavy traffic... wait for a more appropriate time to do the calibration
	Verify, if so equipped, that the flow hammer on the bulk feed tank is not running.
	Did you receive feed at the moment of calibration? Wait until the filling is terminated and re-calibrate.
	Did auger run at the moment of calibration? Wait until the feeding is terminated and re-calibrate.
	See “Issues with inputs readings”
	Increase the weight distribution tolerance % in the calibration process. NOTE: doing this might affect the weight accuracy.
	If the problem persists, contact AP/Cumberland or GSI Electronics
Calibration pop-up error message: Calibration sensitivity exceeded input [value] weight fluctuates by more than [value] (meaning: load cell weight reading varies too much)	Verify if the load cells are free of debris, ice, etc.
	Can happen on a windy day or when earth trembles at a passage of a train / heavy traffic... wait for a more appropriate time to do the calibration
	Verify if the load cell mounting brackets are securely fastened.
	Verify, if so equipped, that the flow hammer on the bulk feed tank is not running.
	Did you receive feed at the moment of calibration? Wait until the filling is terminated and re-calibrate.
	Did auger run at the moment of calibration? Wait until the feeding is terminated and re-calibrate.
	See “Issues with inputs readings”
	Increase the calibration sensitivity % in the calibration process. NOTE: doing this will affect the weight accuracy.
	If the problem persists, contact AP/Cumberland or GSI Electronics
Calibration pop-up error message: Calibration sensitivity exceeded. Bulk feed tank weight varies by more than [value] (meaning: Bulk feed tank weight reading varies too much)	Verify if the load cells are free of debris, ice, etc.
	Can happen on a windy day or when earth trembles at a passage of a train / heavy traffic... wait for a more appropriate time to do the calibration
	Verify, if so equipped, if the flow hammer on the bulk feed tank is not running.
	Verify if the load cell mounting brackets are securely fastened.
	Verify, if so equipped, that the flow hammer on the bulk feed tank is not running.

	Did you receive feed at the moment of calibration? Wait until the filling is terminated and re-calibrate.
	Did auger run at the moment of calibration? Wait until the feeding is terminated and re-calibrate.
	See “Issues with inputs readings”
	Increase the calibration sensitivity % in the calibration process. NOTE: doing this will affect the weight accuracy.
	If the problem persists, contact AP/Cumberland or GSI Electronics

NOTES

A LED meanings

EDGE Bin Scale

LED identification	Description
LED1 on PCB-415	LED active when the 5Vdc is present
REF. OC. FAULT on PCB-415	LED lights during over current
LED2 on PCB-415	DEBUG LEDs
LED3 on PCB-415	
LED6 (AUTOMATION-RX) on PCB-415	LED blinks off during activity
LED4 (AUTOMATION-TX) on PCB-415	LED blinks off during activity
LED7 (SAFETY-RX) on PCB-415	LED blinks off during activity
LED5 (SAFETY-TX) on PCB-415	LED blinks off during activity
LED1 on PCB-435	Leds Feedback for 24V and Comm. Status
LED2 on PCB-435	
LED3 on PCB-435	
LED4 on PCB-435	
LED5 on PCB-435	
LED6 on PCB-435	
LED7 on PCB-435	
LED8 on PCB-435	
LED9 on PCB-435	Debug Leds (and Board_ID)
LED10 on PCB-435	

NOTES

B List of Terminals

Table B-1 *EDGE Bin Scale*

Terminal name	Description
FUNCTIONAL EARTH	Functional Ground Terminal Primarily used for functional earth terminals which are generally associated with test and measurement circuits. These terminals are not for safety earthing purposes but provide an earth reference point.
AUTOMATION - 24V	Communication bus 1 - Power supply 24Vdc
AUTOMATION - A	Communication bus 1 - Signal A of RS485 communication
AUTOMATION - B	Communication bus 1 - Signal B of RS485 communication
AUTOMATION - GND	Communication bus 1 - Power supply return
SAFETY - 24V	Communication bus 2 - power supply 24Vdc
SAFETY - A	Communication bus 2 - Signal A of RS485 communication
SAFETY - B	Communication bus 2 - Signal B of RS485 communication
SAFETY - GND	Communication bus 2 - Power supply return
LC(x) - EXC+	Positive Excitation signal supply to the load cell
LC(x) - SIG+	Positive signal from the load cell
LC(x) - SIG-	Negative signal from the load cell
LC(x) - EXC-	Negative Excitation signal supply return for the load cell

NOTES

C Technical Specifications

EDGE Bin Scale 3 Wires LC Safety ratings

INPUTS :

Supply Input : $24V_{DC}$, 3W

Operating Temperature: -40 to 40°C (-40 to 104°F)

Storage Temperature: -40 to 50°C (-40 to 122°F)

Pollution Degree: 2

Installation Category: 2

Altitude: 6561 Ft. Max (2000 Meters Max.)

Operating Relative Humidity (maximum):

- -40 to 0°C (-40 to 32°F) Non condensing
- 0 to 10°C (32 to 50°F) Non condensing
- 10 to 30°C (50 to 86°F) 95 % (± 3 %) Non condensing
- 30 to 40°C (86 to 104°F) 95 % (± 3 %) Non condensing

IP rating (IEC 60529): 66

Nema Rating (Nema 250): 4X

Flame rating (UL94): 5VA V-0

Flame rating (IEC 60695 or IEC 60707): FV-0

IK rating (degree of mechanical protection - impact, IEC 62262): 08

Table C-1 *EDGE Bin Scale 3 Wires LC Functional ratings*

Enclosure dimensions	Height	7 inches (178 mm)
	Width	9 inches (229 mm)
	Depth	3 inches (76.2 mm)
Clearance around the enclosure	Top	6 inches (152 mm)
	Bottom	6 inches (152 mm)
	Sides	6 inches (152 mm)
Weight	2 lbs (907.18 grams)	
Screen	Size	60mm X 37mm
	Type	OLED
	Resolution	128X64

Normal operation (load cell connected)	
Rated input of the load cell (SIG+ and EXC-)	0-5V, 100nA
Voltage of SIG+ and SIG- (referenced to GND)	3V to 4.8V
Voltage of SIG+ (EXCITATION VOLTAGE OF THE LOAD CELL)	4.97V +/- 0.3V
Allowable weight variation	Greater than 3,4% of full scale

Allowable loss of performance in a noisy environment	
Allowable noise on SIG+	100mV
Allowable weight variation due to noise on SIG+	Greater than 3,5% max of full scale

D Safety Characteristics and Certification

Safety characteristics

The controllers are Safety Class I according to IEC classification and has been designed to meet the requirements of UL 61010-1 third edition, CAN/CSA-C22.2 nº 61010-1 third edition, EN 61010-1: 2010 (Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use). It is an Installation Category II intended for operation from a normal single phase supply.

The controllers has been tested in accordance with IEC61010-1 and has been supplied in a safe condition. This instruction manual contains some information and warnings which have to be followed by the user to ensure safe operation and to retain the instrument in a safe condition.

The following safety EU directives were followed:

2014/35/EU	The low voltage directive (LVD)
2014/30/EU	The Electromagnetic compatibility directive (EMC)

NOTE: *EDGE Bin Scale plastic Enclosure is certified to use rigid tubing up to 1 inch (25.4 mm).*

EMC characteristics — emission standards

The controller have been designed to meet the requirements of the EMC Directive 2014/30/EU, the FCC directives, the Industry Canada directives. The compliance was demonstrated by meeting the test limits of the following standards:

EN 61000-6-4 (2007/A1:2011)	Emission tests levels for industrial environment
EN61326-1 (2013)	EMC product standard for Electrical Equipment for Measurement, Control and Laboratory Use
IEC EN 60730-1 (2010):	Automatic electrical controls for household and similar use - Part 1: General requirements - EMC requirements
FCC part 15 Subpart B (2016)	Class A
EMC certification: ICES-003	Information Technology Equipment (issue 6, 2016) – class A

Test number	Test name	Standard	Standard level
1	Conducted emissions	CISPR 11 : 2009 A1 (2010)	Group 1, class A
		FCC part 15, subpart B : 2016	Class A
		ICES-003 (issue 6, 2016)	Class A
2	Radiated emissions	CISPR 11 : 2009 A1 (2010)	Group 1, class A
		FCC part 15, subpart B : 2016	Class A
		ICES-003 (issue 6, 2016)	Class A

EMC characteristics — immunity standards

The controller has been designed to meet the requirements of the EMC Directive 2014/30/EU, the FCC directives, the Industry Canada directives. The compliance was demonstrated by meeting the test limits of the following standards:

EN61326-1 (2013)	EMC product standard for Electrical Equipment for Measurement, Control and Laboratory Use
EN 61000-6-2 (2006):	Immunity tests levels for industrial environment
IEC EN 60730-1 (2010):	Automatic electrical controls for household and similar use - Part 1: General requirements - EMC requirements

Test number	Test name	Standard	Standard level
5	Radiated, radio-frequency, electromagnetic field immunity test	IEC61000-4-3 : 2006 A1 : 2007 A2 : 2010	Modulation: 80% AM at 1kHz, 80MHz - 1GHz: 10V/m 1.4GHz-2 GHz: 3 V/m 2GHz-2.7GHz: 1 V/m Performance: A (A)
6	Immunity to conducted disturbances, induced by radio-frequency fields	IEC61000-4-6 : 2013	Frequency test range : 150KHz and 80Mhz at 10Vrms Pause time: 0,5s (AC line, Earth, I/O connections >3m) Performance A (A)
7	Electrostatic discharge immunity test	IEC61000-4-2 : 2008	± 8 kV air ± 6kV contact Performance A (B)
8	Electrical fast transient/ burst immunity test	IEC61000-4-4 : 2012	±1kV/5kHz on the I/O >3m Performance A (B)
9	Surge immunity test	IEC61000-4-5 : 2014	I/O : L-PE : ±1kV L-L : ±1kV
10	Power frequency magnetic field immunity test	IEC61000-4-8 : 2009	30 A/m, Performance A (B)

The definitions of performance criteria are as follows:

- Performance criterion A — During test normal performance within the specification limits
- Performance criterion B — During test, temporary degradation, or loss of function or performance which is self-recovering
- Performance criterion C — During test, temporary degradation, or loss of function or performance which requires operator intervention or system reset occurs.

Normal operation (load cell connected)	Percentage
Allowable weight variation of EDGE Bin Scale 4 Wires LC	0.6% error from the EDGE Bin Scale plus combined errors caused by the load cell model (typical error percentage: 1,7% to 2,8%) 3,4% max of full scale
Allowable weight variation of EDGE Bin Scale 3 Wires LC	Greater than 3,4% of full scale

Allowable loss of performance in a noisy environment	Percentage
Allowable noise on EXC+ on EDGE Bin Scale 4 wires Lc	0.7% error from the EDGE Bin Scale plus combined errors caused by the load cell model (typical error percentage: 1,7% to 2,9%) 3,5% max of full scale
Allowable weight variation due to noise on SIG+ on EDGE Bin Scale 3 wires Lc	Greater than 3,5% of full scale

EDGE Bin Scale element	Normal operation	Allowable loss of performance
RS-485 link	1 communication frame loss	3 consecutive communication frames losses
OLED display	No visual degradation	No visual degradation

Environment characteristics

Parameter	Condition	Value
Environment Location	Inside and outside	
Operating Temperature	Operating	-40 to 40°C (-40 to 104°F)
	Storage	-40 to +50°C (-40 to +122°F)
Humidity (Maximum Relative)	-40 to 0°C (-40 to 32°F)	Non condensing
	0 to 10°C (32 to 50°F)	Non condensing
	10 to 30 °C (50 to 86 °F)	95 % (± 3%) Non condensing
	30 to 40 °C (86 to 104 °F)	95 % (± 3%) Non condensing
	Storage	Non condensing
Altitude		2000 Meters Max. (6561 Ft. Max)
Electromagnetic Environment		EN/IEC61326-1, IEC EN 60730-1, EN 61000-6-4, EN 61000-6-2
Enclosure Protection		Nema 250 : type 4x IP : 66, ref : IEC60529
Impact rating (IK)		08

The controller was tested under IEC60068-1 (Environmental testing - Part 1: General and guidance)

Environmental characteristics

The following environmental EU directives were followed:

2011/65/EU	The RoHS 2 Directive
2012/19/EU	The WEEE 2 Directive
1907/2006/EU	The REACH regulation
2006/66/EC	The Battery Directive
94/62/EC	Packaging and packaging waste Directive
97/129/EC	Packaging material identification Directive

E EC Declaration of Conformity (In accordance with EN ISO 17050-1 2004)

We: GSI Electronics Inc.

Of: 5200, Armand-Frappier, Saint-Hubert (Québec), Canada, J3Z 1G5

In accordance with the following directives:

2014/35/EU The Low Voltage Directive (LVD)

2014/30/EU The Electromagnetic Compatibility Directive (EMC)

2011/65/EU The RoHS 2 Directive

2012/19/EU The WEEE 2 Directive

1907/2006/EC The REACH regulation

2006/66/EC The Battery Directive

94/62/EC Packaging and packaging waste Directive

97/129/EC Packaging material identification Directive

Hereby declare that:

Equipment: The Edge system is a farm system network designed to monitor and to control of a farm environment. The main functions of monitoring or controlling are: ventilation control, heating control, lighting control, animal feeding control, scale control, quality air control.

Model numbers:

EDGE Bin Scale 4 Wires LC

EDGE Bin Scale 4 Wires LC TB

EDGE Bin Scale 3 Wires LC

is in conformity with the applicable requirements of the following documents:

Directive	Ref. No	Title	Edition/date
LVD	EN 61010-1	Safety requirements for electrical equipment for measurement, control, and laboratory use Part 1: General requirements	2010
EMC	EN 61326-1	Electrical equipment for measurement, control and laboratory use - EMC requirements	2013

EMC	EN 61000-6-2	Immunity tests levels for industrial environment EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-4-8	2006 2009 2006 A1 (2007) A2 (2010) 2012 2014 2014 A1(2015) 2010
EMC	EN 61000-6-4	Emission tests levels for industrial environment CISPR11 /EN 55011	2007/A1:2011 2008 (2009)+A1 (2010)
EMC	IEC EN 60730-1	Automatic electrical controls for household and similar use - Part 1: General requirements- EMC requirements Immunity and emission part CISPR11 /EN 55011 EN 61000-4-2 IEC EN 61000-4-3 EN 61000-4-4 IEC EN 61000-4-5 IEC EN 61000-4-6 EN 61000-4-8	2010 (2009)+A1 (2010) 2009 2006 A1 (2007) A2 (2010) 2012 2014 2014 A1(2015) 2010
RoHS	EN 50581	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances	2012

GSI Electronic Inc. hereby declares that the equipment named above has been designed to comply with the relevant sections of the above referenced specifications. The unit complies with all applicable Essential Requirements of the Directives.

CE

F Innovation, Science and Economic Development Canada Statement

This device complies with ICES-003 of Innovation, Science and Economic Development Canada Rules. Operation of this device is subject to the following two (2) conditions:

(1) This device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

Ce dispositif est conforme à la norme ICES-003 d' Innovation, Sciences et Développement économique Canada. Son fonctionnement est sujet aux deux conditions suivantes:

(1) le dispositif ne doit pas produire de brouillage préjudiciable, et

(2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

NOTES

G FCC part 15 statement

Statement regarding the importation of radio frequency devices capable of causing harmful interference

GSI Electronics Inc. develops, manufactures and distributes innovative technological products for the agricultural industry. Our unique expertise allows us to offer accurate, simple and diverse electronic, data processing and mechanical solutions for improving agricultural production.

Electronic controllers are classed as unintentional radiators (FCC 47-part 15-Subpart B). Electronic controllers are used in a production context and in an industrial context (FCC 47-part 15-Subpart B-Class A).

GSI Electronic Inc. hereby declares that the equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case you will be required to correct the interference at his own expense.

NOTES

H FDA declaration

Statement regarding the importation of devices and public health hazard directives from FDA (U.S. Food and Drug Administration)

GSI Electronics Inc. develops, manufactures and distributes innovative technological products for the agricultural industry. Our unique expertise allows us to offer accurate, simple and diverse electronic, data processing and mechanical solutions for improving agricultural production.

GSI Electronics' controllers are shipping under 9032.89.60.30 Canada (Automatic Regulating or Controlling Instruments & Apparatus). Electronic controllers are used to monitor and to control animal environment in a barn: ventilation function; heating function; lightning function; alert system function. Electronic controllers can be used to control the food distribution and to scale animals.

Electronic controllers do not use radiation technologies or laser technologies. Electronic controllers use liquid crystal display (LCD) or Light-emitting diodes (LED). Electronic controllers do not use telecommunication wireless technologies. Electronic controllers are classed as unintentional radiators (FCC 47-part 15-Subpart B). Electronic controllers are used in a production context and in an industrial context (FCC 47-part 15-Subpart B-Class A). GSI Electronics devices are not used in contact with animal food. Electronic controllers do not manipulate vaccines or drugs.

t is important to note also that electronic controller incorporating Liquid Crystal Displays (LCD) or Light-emitting diodes (LED) are not capable of emitting x-radiation. As such these products and are not subject to the FDA standard and do not pose a public health hazard.

NOTES

I Reduction of Hazardous Substances

REACH Directive

The REACH directive addresses the production and use of chemical substances, and their potential impacts on both human health and the environment. On June 1, 2007, the European Commission promulgated new legislation that covers the registration, evaluation, authorization and restriction of chemical within the European Union community. This new regulation is commonly known as REACH, an acronym for **R**egistration, **E**valuation and **A**uthorization of **Ch**emicals (EC Regulation 1907/2006).

GSI Electronics supports the underlying goals of REACH, which are consistent with our own commitment to promote the responsible manufacturing, use and handling of chemicals. GSI Electronics uses and promotes components suppliers or components manufacturers who will meet the pre-registration deadline for all chemical substances in quantities greater than one metric ton. The information provided here is accurate to the best of our knowledge at the present time.

RoHS Directive

The **R**estriction **o**f **H**azardous **S**ubstances Directive 2002/95/EC, RoHS, Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment, was adopted in February 2003 by the European Union. The RoHS directive took effect on 1 July 2006, and is required to be enforced and become law in each member state. This directive restricts (with exceptions) the use of six hazardous materials in the manufacture of various types of electronic and electrical equipment: Lead (Pb), Mercury (Hg), Cadmium (Cd), Hexavalent chromium (Cr6+), Polybrominated biphenyls (PBB), Polybrominated diphenyl ether (PBDE). The RoHS 2 directive (2011/65/EU) is an evolution of the original directive and became law on 21 July 2011 and took effect 2 January 2013. It addresses the same substances as the original directive while improving regulatory conditions and legal clarity.

GSI Electronics hereby certifies that all components are RoHS Compliant and fulfills the definition and restrictions defined under Directive 2011/65/EU of the European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE). The information provided here is accurate to the best of our knowledge at the present time.

The RoHS declaration is available, contact GSI Electronics or the European representative.

Battery Directive

The Battery Directive, Directive 2006/66/EC (Previous Directive, Directive 91/157/EEC), of the European Parliament regulates the manufacture, the disposal, the recycling of batteries and accumulators in the European Union.

GSI Electronics uses Lithium cell button in a light industrial context or industrial context. GSI Electronics encourages the batteries and accumulators recycling.

NOTES

J Disposal and Recycling Information

North America: Canada

As the concern for the volume of electronic waste grows, a number of Provinces in Canada have passed regulations since 2006 to divert electronics waste from the landfills and to protect the environment. These waste diversion regulations require manufacturers of covered electronic devices to participate in approved electronic product stewardship programs. The programs allow consumers and businesses to drop off eligible electronic devices for recycling, free of charge at numerous depots throughout the Province.

For more detailed information about the recycling of the device or batteries, contact your local city office, the household waste disposal service, or the retail store where you purchased this device. These collection points are accessible free of charge.

North America: United States

For more detailed information about the recycling of the device or batteries, contact your local city office, the household waste disposal service, or the retail store where you purchased this device. These collection points are accessible free of charge.

European Markets – WEEE Directive

The **W**aste **E**lectrical and **E**lectronic **E**quipment Directive (WEEE Directive) is the European directive on waste electrical and electronic equipment (Directive 2002/96/EC) which, together with the RoHS Directive 2002/95/EC, became European Law in February 2003. The WEEE Directive set collection, recycling and recovery targets for all types of electrical products. And later the WEEE Recast Directive 2012/19/EU requiring producers of electronic equipment to manage and finance the collection, reuse, recycling and appropriately treat WEEE that the producer places on the EU market after 13th August 2005.

As required by the legislation, products sold in the EU are marked with the "crossed out wheelie bin" symbol. GSI Electronics uses the symbol based on the EN 50419:2005 CENELEC standard. The bottom bar certifies the product concerned was placed on the market after 13th August 2005. Cables or components and sub-assemblies contained within the in the product will not be marked.

Instructions for Disposal of Waste Equipment by Users

The "crossed out wheelie bin" symbol on the device (and any included batteries) indicates that they should not be disposed of as normal household garbage. Do not dispose of your device or batteries as unsorted municipal waste. The device (and any batteries) should be handed over to a certified collection point for recycling or proper disposal at the end of their life.

For more detailed information about the recycling of the device or batteries, contact your local city office, the household waste disposal service, or the retail store where you purchased this device. These

collection points are accessible free of charge. All products with this sign must be brought to these collection points.

The disposal of this device is subject to the Waste from Electrical and Electronic Equipment (WEEE) directive of the European Union. The reason for separating WEEE and batteries from other waste is to minimize the potential environmental impacts on human health of any hazardous substances that may be present.

There are two ways available to dispose of waste:

- Public system— contact your municipality or the nearest collection site to dispose of Electrical and electronic Equipment waste
- Private system— For a Return Material Authorization for Disposal of Waste Equipment, contact customer support at 1-877-926-2777 or by e-mail at mtl_techsupport@agcocorp.com.

K California Proposition 65

California Proposition 65 - Statement regarding the importation of devices and public health hazard directives from The Office of Environmental Health Hazard Assessment (OEHHA)

In 1986, California voters approved Proposition 65, an initiative to address their growing concerns about exposure to toxic chemicals. That initiative is officially known as the Safe Drinking Water and Toxic Enforcement Act of 1986. The law requires California to publish a list of chemicals known to cause cancer or reproductive toxicity, and for businesses with 10 or more employees to provide warnings when they knowingly and intentionally cause significant exposures to listed chemicals.

This list currently includes more than 850 chemicals. Proposition 65 does not ban or restrict the sale of chemicals on the list. The warnings are intended to help Californians make informed decisions about their exposures to these chemicals from the products they use and the places they go.

The Office of Environmental Health Hazard Assessment (OEHHA) administers the Proposition 65 program.

In 2016, OEHHA launched a new website, *www.P65Warnings.ca.gov*, to provide the public with more information on chemicals, products, and locations associated with Proposition 65 warnings. The website is part of the state's effort to provide Californians with more useful information on chemicals they are being exposed to and ways to protect themselves.

People who read Proposition 65 warnings and want to learn more can go to the website to find additional information about chemicals and best practices for reducing or eliminating exposures. The website contains fact sheets about Proposition 65 chemicals and specific types of exposure, such as from furniture products or enclosed parking facilities. It also answers frequently asked questions about Proposition 65 and includes a glossary of Proposition 65 terms.

GSI Electronics Inc. develops, manufactures and distributes innovative technological products for the agricultural industry. Our unique expertise allows us to offer accurate, simple and diverse electronic, data processing and mechanical solutions for improving agricultural production.

GSI Electronics' controllers are shipping under 9032.89.60.30 Canada (Automatic Regulating or Controlling Instruments & Apparatus). Electronic controllers are used to monitor and to control animal environment in a barn: ventilation function; heating function; lightning function; alert system function. Electronic controllers can be used to control the food distribution and to scale animals.

GSI Electronics Inc. Hereby declare that Electronic controllers can contain chemicals listed from OEHHA Chemicals list.

NOTES

L Product material composition

EDGE Bin scale

Material	Weight		Weight ratio (%)
	Lbs	Grams	
Packaging material	0,85	385,55	29,82
Plastic material	1,25	566,99	43,86
Electronic Circuits	0,65	294,84	22,81
Cable	0,05	22,68	1,75
Metal	0,05	22,68	1,75

NOTES

M Packaging Characteristics

The following directives were followed during the packaging process

2011/65/EU	The RoHS 2 directive
2012/19/EU	The WEEE 2 directive
1907/2006/EU	The REACH regulation
2006/66/EC	The battery directive
94/62/EC	Packaging and packaging waste directive
97/129/EC	Packaging material identification directive

Packaging is only in cardboard to respect international standards about environment standards:

EN 13428	Packaging - Requirements specific to manufacturing and composition - Prevention by source reduction
EN 13429	Packaging - Reuse
EN 13430	Packaging - Requirements for packaging recoverable by material recycling
EN 13431	13431 Packaging - Requirements for packaging recoverable in the form of energy recovery, including specification of minimum inferior calorific value
EN 13432	Packaging - Requirements for packaging recoverable through composting and biodegradation - Test scheme and evaluation criteria for the final acceptance of packaging

Packaging was tested under ISTA 3A (Packaged Products for Parcel Delivery System Shipment weighing 150 lbs or less – is a test used for simulating courier companies shipping environments).

Shipping, packaging and Lithium battery: packaging shall be capable of withstanding a 1.2 m drop test in any orientation without damage to cells or batteries contained therein according to the International Civil Aviation Organization (ICAO), the International Air Transport Association (IATA), the International Maritime Organization (IMO) requirements.

Handling symbols on packaging: the standard is ISO R/780 (Packaging - Pictorial marking for handling of goods).

NOTES

N Low Voltage Cable Specifications

Communication Bus (Automation/Safety)

Table N-1 *Communication cables (Signal A and signal B)*

Cable Parameter	Value		
	Minimum	**Typical**	**Maxium**
Cable type	Twisted and shielded		
Minimum gauge	18AWG (*diameter of 1.02mm or cross sectional area of 0.82mm²)*		
Maximum cable length (including cable extensions)	1200 meters (4000 feet)		
Certification and type	CSA,CMG FT4 type, 18AWG, 600V, 194˚F 90˚C) UL,AWM or CM type, 18AWG, 600V, 194˚F 90˚C) If DC power is used in the same cable use TC-ER type (600V, 194°F (minimum 90°C))		
Characteristic Impedance	73 Ω	120 Ω	140 Ω
Inductance	—	0.258 µH/ft, Nominal	0.3 µH/ft
Mutual Capacitance	—	12 pF/ft	30 pF/ft
Velocity of propagation	66%	75%	—
Conductor DCR	—	6.9Ω/1000ft @ 20°C, Nominal	8Ω/1000ft Max @ 20°C
OA Shield DCR	—	1.8Ω/1000ft @ 20°C, Nominal	7Ω/1000ft
Attenuation (Max dB/100ft)		0.13 @ 125 kHz 0.25 @ 500 kHz 0.36 @ 1 MHz	
Pair Lay Length	—	2.50” LHL	2.75” LHL
Jacket Diameter*	—	0.414 inch	0.449 inch

* Some products are provided with strain reliefs. If the cable diameter goes over this diameter value, the strain reliefs may not work properly.

Table N-2 *DC Power cables (Signal 24V and signal GND)*

Parameter	Wire gage when a load of 17W (max 0.7A) is connected between the source and the load				
Wire gauge	**18 AWG** *(diameter of 1.02mm or cross sectional area of 0.82mm²)*	**16* AWG** *(diameter of 1.29mm or cross sectional area of 1.30mm²)*	**14 AWG** *(diameter of 1.62mm or cross sectional area of 2.08mm²)*	**12 AWG** *(diameter of 2.05mm or cross sectional area of 3.30mm²)*	**10 AWG** *(diameter of 2.58mm or cross sectional area of 5.26mm²)*
	1 pair twisted shielded	1 pair twisted shielded	1 pair twisted shielded	1 pair twisted shielded	1 pair twisted shielded
Max. length	150m (500 ft.)	300m (1000 ft.)	600m (2000 ft.)	900m (3000 ft.)	1200m (4000 ft.)
Inductance Nominal (typical)	0.17 µH/ft	0.174 µH/ft	0.16 µH/ft	0.16 µH/ft	0.14 µH/ft
Conductor DCR @20°C, Nominal (typical)	6.1 Ω/1000ft	3.6 Ω/1000ft	2.6 Ω/1000ft	1.63 Ω/1000ft	1.09 Ω/1000ft
Certification and type	CSA,CIC (TC-ER) FT4 type, 16AWG, 600V, 194˚F (minimum 90˚C) UL, TC-ER FT4 type, 16AWG, 600V, 194˚F (minimum 90˚C)				
Maximum Jacket diameter*	0.449 inch				

* Some products are provided with strain reliefs. If the cable diameter goes over this diameter value, the strain reliefs may not work properly.

WARNING ***Insulation on conductors must be rated for 600 Volts and 90°C (194°F).***

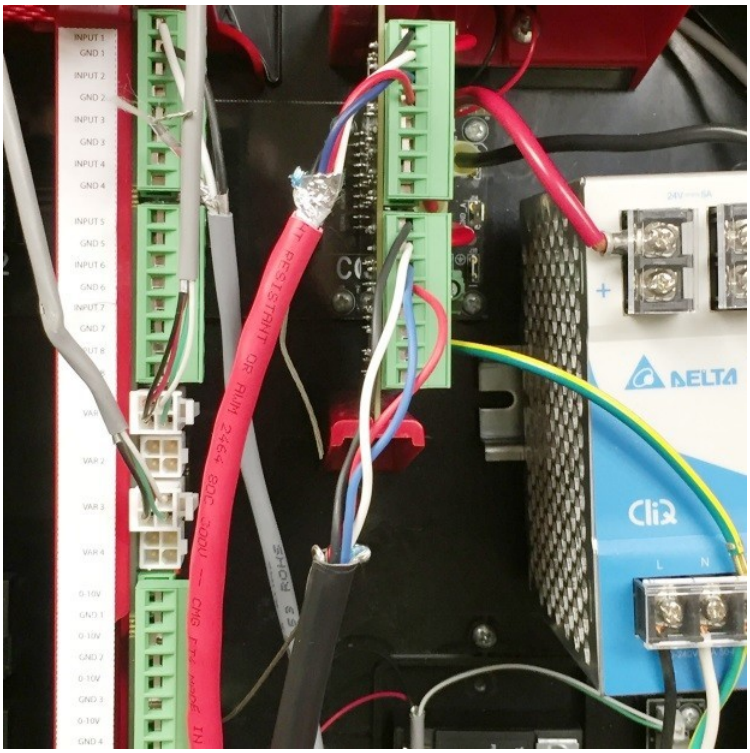
NOTICE ***EDGE network cables have to use class 1 load type. AP/Cumberland recommends using TC-ER cable type.***

NOTICE ***Refer to the Wiring Methods and Materials section from the National Electric Code to use the correct wire for the installation.***

NOTICE ***TC-ER conductors in sizes 18 AWG and 16 AWG shall be type FFH-2, KF-2, KFF-2, PAF, PAFF, PF, PFF, PGF, PGFF, PTF, PTFF, RFH-2, RFHH-2, RFHH-3, SF-2, SFF-2, TF, TFF, TFFN, TFN, ZF, or ZFF. Conductor with other types and thicknesses of insulation shall be listed for Class 1 load circuit use.***

AP/Cumberland can provide sourced color-coded communication wire to install EDGE controls. The wire will be available in both 16 and 18 gauge to accommodate the specified distance between controls (as shown above). The communication wire is available in one or two twisted shielded pairs, and with two different outside jacket colors (red and black.) Black-jacketed wire is to be used for the automation circuit

and red-jacketed wire is to be used for the safety circuit. Each of the communication wires is comprised of two or four unique colored wires to further reduce installation errors.



Power Cable Requirements	
Distance	Minimum Wire AWG
500' (150 m) *	18 AWG
1000' (300 m)	16 AWG
* Maximum distance between any two expansion boxes	

Communication Cable Requirements	
Distance	Minimum Wire AWG
4000' (1200 m) *	18 AWG
* Total Distance from first control to last control	

Item	Description	Lbs.	Kgs.
WR-16-1TS-S	Wire, 16 AWG 1 Twisted Shielded Pair, Comm & Power, 600V, 1000'/ Spool	44	20.00
WR-16-2TS-S	Wire, 16 AWG 2 Twisted Shielded PairS, Comm & Power, 600V, 1000'/ Spool	84	38.18
WR-16RED-1TS-S	Wire, 16 AWG 1 Twisted Shielded Pair, Comm & Power, 600V, Red Jacket, 1000'/Spool	44	20.00
WR-16RED-2TS-S	Wire, 16 AWG 2 Twisted Shielded PairS, Comm & Power, 600V, Red Jacket, 1000'/Spool	84	38.18
WR-18-1TS-S	Wire, 18 AWG 1 Twisted Shielded Pair, Comm & Power, 600V, 1000'/ Spool	25	11.36
WR-18-2TS-S	Wire, 18 AWG 2 Twisted Shielded PairS, Comm & Power, 600V, 1000'/ Spool	66	30.00
WR-18RED-1TS-S	Wire, 18 AWG 1 Twisted Shielded Pair, Comm & Power, 600V, Red Jacket, 1000'/Spool	25	11.36
WR-18RED-2TS-S	Wire, 18 AWG 2 Twisted Shielded PairS, Comm & Power, 600V, Red Jacket, 1000'/Spool	66	30.00

Other Low Voltage Cables

Table N-3 *Other Low Voltage Cables*

Item	Description
Cable type	Twisted and shielded
Minimum gauge	18AWG (*diameter of 1.02mm or cross sectional area of 0.82mm²)*
Maximum sensor cable length	150 m (500 feet)
Temperature cable	194°F (minimum 90°C)
Class load type	2

For example:

- Sensor cables (humidity, temperature, static pressure, gas sensor, …etc.)
- Potentiometer cables

O EDGE Bin Scale - Product End-of-Life Disassembly Instructions

This disassembly and recycling guidance provides general guidance for the disassembly of the referenced product to remove components and materials requiring selective treatment, as defined by EU directive 2002/96/EC and, Waste Electrical and Electronic Equipment (WEEE).

Models and description

This document provides disassembly instructions for the product listed in the following table :

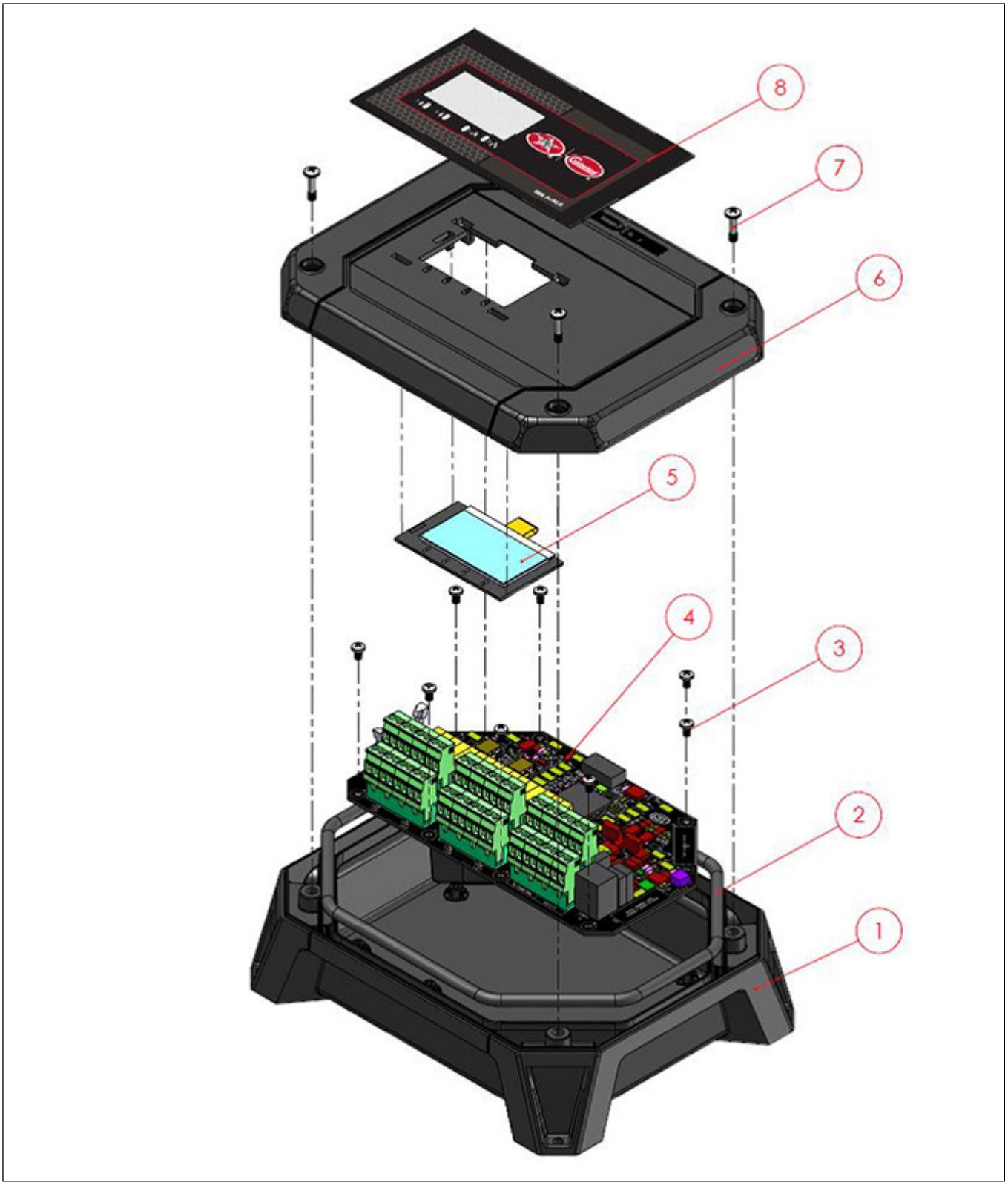
Marketing name (GSI Electronics Part number)	Description
EDGE Bin Scale	Auxiliary modules

Required Tools

The following table lists the type and size of the tools that would typically be used to disassemble the product to a point where components and materials requiring selective treatment can be removed.

Tool description	Tool size
Phillips screw driver	#1
Phillips screw driver	#2
Flat-head screw driver	Small
Flat-head screw driver	Large
Side cutters	——

Disassembly of EDGE Bin scale



Item number	Description	Item number	Description
1	Plastic Bottom	5	PCB-435 and OLED screen
2	Gasket	6	Plastic cover
3	Screw,#6-19,1/4in	7	Screw,M4-0.7,16mm
4	PCB-415	8	Lexan membrane

Items Requiring Selective Treatment

Items in the product that are classified as requiring selective treatment are provided in the following table.

EDGE Bin/Bird Scale			
Item Description	**Notes**	**Qty. of Items Included in the product**	**Location**
Printed Circuit Boards (PCB) or Printed Circuit Assemblies (PCA)	With a surface greater than 10 square cm	2	PCB-415 (item 4) PCB-435 or PCB-414 (item 5)
Batteries	All types including standard alkaline and lithium coin or button style batteries.	none	
Mercury containing components	For example, mercury in lamps, display backlights, scanner lamps, lamps, lightning application, switches, batteries.	none	
Liquid Crystal Displays (LCD)	With a surface greater than 100 square cm and all those back-lighted with gas discharge lamps.	1	OLED on PCB-435 or PCB-414 (item 5)
Cathode Ray Tubes (CRT)		none	
Capacitors / condensers	Containing polychlorinated biphenyls PCB / polychlorinated terphenyls PCT.	none	
Electrolytic Capacitors / Condensers	Measuring greater than 2.5cm in diameter or height.	none	
External electrical cables and cords		none[1]	
Gas Discharge Lamps		none	
Plastics containing Brominated Flame Retardants		none[2]	
Components and parts containing toner and ink, including liquids, semi-liquids (gel/paste) and toner		none	

EDGE Bin/Bird Scale			
Item Description	**Notes**	**Qty. of Items Included in the product**	**Location**
Components and waste containing asbestos		none	
Components, parts and materials containing refractory ceramic fibres		none	
Components, parts and materials containing radioactive substances		none	
Components, parts and materials containing chlorofluorocarbons (CFC), hydrochlorofluor-ocarbons (HCFC), hydrofluorocarbons (HFC), hydrocarbons (HC)		none	

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Product Disassembly Process

The next session lists the basic steps that you should follow to remove components for recycling and materials requiring selective treatment.

Step	Process
Remove External Elec-trical cables and internal Electrical cables	1. Unscrew and remove the enclosure cover (item 6) 2. Remove the wires from the enclosure bottom (item 1), by unscrewing terminal blocks with a small flat-head screwdriver and a large flat-head screwdriver. 3. Remove the cable between the PCB-415 (item 4) and the PCB-435 or PCB-414 (item 5)
Printed Circuit Assembly	1. Unscrew and remove the enclosure cover (item 6) 2. Locate these PCBs: PCB-415 (item 4) PCB-435 or PCB-414 (item 5) 3. Unscrew with a Philips screwdriver #1 and remove the screws (item 3) from the PCB-415 (item 4) 4. Unfasten the PCB-435 or PCB-414 from the enclosure cover 5. Remove the PCBs from the EDGE Bin Scale

1. GSI Electronics does not provide the external electrical cable
2. All plastics used in this product are RoHS compliant and do not contain PBBs or PBDEs

Remove the OLED	Cables are unplugged 1. Unscrew and remove the enclosure cover (item 6) 2. Unfasten the PCB-435 or PCB-414 from the enclosure cover
Recycle plastic	1. Unscrew and remove the enclosure cover (item 6) 2. From the enclosure bottom, remove the gasket (item 2) 3. Keep only plastic parts 4. Recycle the plastic enclosure and the plastic parts.

NOTES

Limited Warranty — N.A. Grain Products

The GSI Group, LLC. (“GSI”) warrants products which it manufactures, to be free of defects in materials and workmanship under normal usage and conditions for a period of 12 months from the date of shipment (or, if shipped by vessel, 14 months from the date of arrival at the port of discharge). If, in GSI’s sole judgment, a product is found to have a defect in materials and/or workmanship, GSI will, at its own option and expense, repair or replace the product or refund the purchase price. This Limited Warranty is subject to extension and other terms as set forth below.

Warranty Enhancements: The warranty period for the following products is enhanced as shown below and is in lieu of (and not in addition to) the above stated warranty period. (Warranty Period is from date of shipment.)

	Product	Warranty Period
Storage	Grain Bin Structural Design ▪ Roof, doors, platforms and walk arounds ▪ Flooring (when installed using GSI specified floor support system for that floor) ▪ Hopper tanks	5 Years
Conditioning	Dryer Structural Design – (Tower, Portable and TopDry) ▪ Includes (frame, portable dryer screens, ladders, access doors and platforms)	5 Years
	All other Dryer parts including: ▪ Electrical (controls, sensors, switches & internal wiring)	2 Years
	Bullseye Controllers	2 Years
Material Handling	Bucket Elevators Structural Design	5 Years
	Towers Structural Design	5 Years
	Catwalks Structural Design	5 Years
	Accessories (stairs, ladders and platforms) Structural Design	5 Years

Conditions and Limitations:

THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE LIMITED WARRANTY DESCRIPTION SET FORTH HEREIN; SPECIFICALLY, GSI DISCLAIMS ANY AND ALL OTHER WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE IN CONNECTION WITH: (I) ANY PRODUCT MANUFACTURED OR SOLD BY GSI, OR (II) ANY ADVICE, INSTRUCTION, RECOMMENDATION OR SUGGESTION PROVIDED BY AN AGENT, REPRESENTATIVE OR EMPLOYEE OF GSI REGARDING OR RELATED TO THE CONFIGURATION, INSTALLATION, LAYOUT, SUITABILITY FOR A PARTICULAR PURPOSE, OR DESIGN OF SUCH PRODUCTS.

The sole and exclusive remedy for any claimant is set forth in this Limited Warranty and shall not exceed the amount paid for the product purchased. This Warranty only covers the value of the warranted parts and equipment, and does not cover labor charges for removing or installing defective parts, shipping charges with respect to such parts, any applicable sales or other taxes, or any other charges or expenses not specified in this Warranty. GSI shall not be liable for any other direct, indirect, incidental or consequential damages, including, without limitation, loss of anticipated profits or benefits. Expenses incurred by or on behalf of a claimant without prior written authorization from the GSI warranty department shall not be reimbursed. This warranty is not transferable and applies only to the original end-user. GSI shall have no obligation or responsibility for any representations or warranties made by or on behalf of any dealer, agent or distributor. Prior to installation, the end-user bears all responsibility to comply with federal, state and local codes which apply to the location and installation of the products.

This Limited Warranty extends solely to products sold by GSI and does not cover any parts, components or materials used in conjunction with the product, that are not sold by GSI. GSI assumes no responsibility for claims resulting from construction defects, unauthorized modifications, corrosion or other cosmetic issues caused by storage, application or environmental conditions. Modifications to products not specifically delineated in the manual accompanying the product at initial sale will void all warranties. This Limited Warranty shall not extend to products or parts which have been damaged by negligent use, misuse, alteration, accident or which have been improperly/inadequately maintained.

Notice Procedure:

In order to make a valid warranty claim a written notice of the claim must be submitted, using the RMA form, within 60 days of discovery of a warrantable nonconformance. The RMA form is found on the OneGSI portal.

Service Parts:

GSI warrants, subject to all other conditions described in this Warranty, Service Parts which it manufactures for a period of 12 months from the date of purchase unless specified in Enhancements above.

(Limited Warranty - N.A. Grain Products_ revised 19 October 2018)

This equipment shall be installed in accordance with the current installation codes and applicable regulations which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made.

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